ELECTION SYSTEMS AND SOFTWARE (ES&S)

EVS 5.0.0.0

PHYSICAL CONFIGURATION AUDIT

T59087.01 Appendix A.9

1.0 INTRODUCTION

A Physical Configuration Audit (PCA) of the ES&S EVS 5.0.0.0 Voting System was performed by Wyle Laboratories qualified personnel as part of the certification test campaign. The PCA consisted of inspecting: ElectionWare software, Election Reporting Manager (ERM) software, AutoMark Voter Assist Terminal (VAT) unit, DS200 precinct scan unit, DS850 central scan unit, and all accessories, equipment and documentation used with the system. All software versions, of the ElectionWare, ERM, AutoMark VAT, DS200, and DS850 were identified during the Physical Configuration Audit.

1.1 Scope

The EVS 5.0.0.0 System is a paper-based voting system that includes:

- ElectionWare
- Election Results Manager (ERM)
- ES&S Event Log Service
- VAT Previewer
- Removable Media Service
- Precinct Count Digital Scanner – DS200
- Voter Assist Terminal – AutoMARK A100, AutoMark A200, AutoMark A300
- Central Count Digital Scanner – DS850

The DS200, AutoMARK A100/A200, and DS850 have been submitted for testing in previous EAC campaigns. Wyle personnel will analyze each unit to determine prior testing acceptance (annotated later in the test plan) based on modifications to the unit, which includes software, hardware and functional modifications. Based on this data, each unit shall be subjected to the tests required to ensure that all applicable VVSG requirements are met.

The software utilized in the system will also be compared to versions that have been submitted for testing in previous EAC campaigns at Wyle to determine the extent of the source code review required (annotated later in the test plan). Based on this data, Wyle personnel will execute software code review to ensure that all applicable VVSG requirements are met and changes to the software did not affect any operational features of the voting system.

The complete system shall be tested in a full system integration test to ensure all components interact properly in the current system configurations listed in the EVS 5.0.0.0 scope.

1.2 References

The documents listed below were used in the development of the Test Plan and are utilized to perform certification testing.

- EAC 2005 VVSG
- WoP 25 Physical Configuration Audit

1.3 Terms and Abbreviations

This subsection defines all terms and abbreviations applicable to the development of this PCA Review.

ADA – Americans with Disabilities Act
ATI – Audio Tactile Interface
CM – Configuration Management

COTS – Commercial off the Shelf
ECO – Engineering Change Order
EAC – Election Assistance Commission
EMS – Election Management System
EUT – Equipment Under Test
ERM – Election Reporting Manager
EVS – ES&S Voting System
LCD – Liquid Crystal Display
IMR – Intelligent Mark Recognition
PCA – Physical Configuration Audit
QA – Quality Assurance
RMS – Removable Media Service
SUT – System Under Test
TDP – Technical Data Package
UELS –ES&S Event Log Service
UPS – Uninterruptible Power Supply
VAT – Voter Assist Terminal
WoP – Wyle Operating Procedure
VSTL – Voting System Test Laboratory
VVSG – Voluntary Voting System Guidelines

1.4 System Overview

The ES&S EVS 5.0.0.0 Election System is a comprehensive suite of vote tabulation equipment and software solutions providing end-to-end election management. The EVS 5.0.0.0 Voting System includes the following core system components detailed in Tables 1-1 and 1-2.

Table 1-1 EVS 5.0.0.0 System Hardware Components

Component	Hardware Version(s)	Firmware Version
DS200	1.2	2.7.0.0
AutoMARK A100	1.0	1.8.1.0
AutoMARK A200	1.1, 1.3	1.8.1.0
AutoMARK A300	1.3	1.8.1.0
DS850	1.0	2.4.0.0

Table 1-2 EVS 5.0.0.0 System Software Components

Component	Version
ElectionWare	4.1.0.0
Election Reporting Manager (ERM)	8.6.0.0
ES&S Event Log Service	1.5.0.0
VAT Previewer	1.8.1.0
Removable Media Service	1.4.0.0

1.5 System Hardware

The ES&S EVS 5.0.0.0 System can be set up to support one or more of the following hardware components:

- DS200 Precinct Tabulator
- AutoMARK Voting Assist Terminal
- DS850 Central Tabulator

Each of these components is described in the following paragraphs:

Precinct Ballot Tabulator: DS200

The precinct ballot tabulator component is the DS200. The DS200 is a digital scan paper ballot tabulator designed for use at the polling place level. After the voter marks a paper ballot, their ballot is inserted into the unit and immediately tabulated. The tabulator uses a high-resolution image-scanning device to image the front and back of the ballot simultaneously. The resulting ballot images are then processed by a proprietary mark recognition engine.

The system includes a 12-inch touch screen display providing voter feedback and poll worker messaging. Once a ballot is tabulated and the system creates cast vote records, the ballot is dropped into an integrated ballot box. The DS200 includes an internal thermal printer for the printing of the zero reports, log reports, and polling place totals upon the official closing of the polls.

Electronic Ballot Marking Device: AutoMARK Voter Assist Terminal (VAT)

The electronic ballot marking device component is the ES&S AutoMARK Voter Assist Terminal (VAT). The AutoMARK VAT assists voters with disabilities by marking optical scan ballots.

The AutoMARK VAT includes two user interfaces to accommodate voters who are visually or physically impaired or voters who are more comfortable reading or hearing instructions and choices in an alternative language. The AutoMARK is equipped with a touch screen and keypad. The touch-screen interface includes various colors and effects to prompt and guide the voter through the ballot marking process. Each key has both Braille and printed text labels designed to indicate function and a related shape to help the voter determine its use.

Regardless whether the voter uses the touch screen or other audio interface, changes can be made throughout the voting process by navigating back to the appropriate screen and selecting the change or altering selections at the mandatory vote summary screen that closes the ballot marking session.

Tabulator: DS850

The DS850 is a high-speed, digital scan central ballot counter. During scanning, the DS850 prints a continuous audit log to a dedicated audit log printer and can print results directly from the scanner to a second connected printer. The scanner saves results internally and to results collection media that officials can use to format and print results from a PC running Election Reporting Manager. The DS850 has an optimum throughput rate of 300 ballots per minute and uses cameras and imaging algorithms to image the front and back of a ballot, evaluate the results and sort ballots into discrete bins to maintain continuous scanning.

EMS Client Server Configuration

EVS 5.0.0.0 Voting System Election Management System (EMS) was configured with a Server running Windows Server 2008 R2 and a combination of a client laptop and a client desktop running Windows 7 Professional.

1.6 System Software

The EVS 5.0.0.0 Election Management System is an application suite comprised of five components: ElectionWare, Election Reporting Manager (ERM), Removable Media Service (RMS), ES&S Event Log Service (UELS), and VAT Previewer.

ElectionWare
ElectionWare integrates the election administration functionality into a unified application. Its intended use is to define an election and create the resultant media files used by the DS200 tabulator, AutoMark Voter Assist Terminal (VAT), the DS850 Central Ballot Scanner, and Election Reporting Manager (ERM). An integrated ballot viewer allows election officials to view the scanned ballot and captured ballot data side-by-side and Produce ballot reports.

Election Reporting Manager (ERM)
Election Reporting Manager (ERM) generates paper and electronic reports for election workers, candidates, and the media. Jurisdictions can use a separate ERM installation to display updated election totals on a monitor as ballot data is tabulated, and send the results reports directly to the media outlets. ERM supports accumulation and combination of ballot results data from all ES&S tabulators. Precinct and accumulated total reports provide a means to accommodate candidate and media requests for totals and are available upon demand. High-speed printers are configured as part of the system accumulation/reporting stations - PC and related software.

Removable Media Service (RMS)
Removable Media Service (RMS) is an application that runs in the background of the EMS client workstation and supports the graceful insertion and removal of election and results USB media.

ES&S Event Log Service (ELS)
ES&S Event Log Service is a Windows Service that runs in the background of any active ES&S Election Management software application to monitor the proper functioning of the Windows Event Viewer. The ES&S Event Log Service closes any active ES&S software application if the system detects the improper deactivation of the Windows Event Viewer.

VAT Previewer
The VAT Previewer is an application within the EMS program that allows the user to preview audio text and screen layout prior to burning Election Day media for the AutoMARK.

The major applications also require other utilities. Below is a list of each application and its associated utilities:

Table 1-3 EVS 5.0.0.0 Software Utilities

ElectionWare	ERM	Encryption Utilities	Event Log Services	Removable Media Service
PaperBallot	CB_EVT.dll	RSACrypto.EXE		
libCoNG.dll	CB_XML.dll		CreatLog	RMUCli.EXE
EssXML	CB_XMLConv.dll		EssEvt	RmuDLL.DLL
SQL	ERMXMLConvDLL.dll		EssEvtA	RmuSvc.EXE
	ERMXMLData.dll		EssEvtMsg	
	ExitWin.exe		EvtSvc	
	MyDLL.dll		LogEvent	
	RegUtil.dll			
	Shell.exe			
	ShellSetup.exe			

1.7 Technical Data Package Overview

As part of the Physical Configuration Audit of the ES&S EVS 5.0.0.0 Voting System, an initial review of the Technical Data Package (TDP) submitted by ES&S was performed to ensure that all documentation required by a user to install, validate, operate, and maintain the system were present.

2.0 HARDWARE

2.1 Hardware Components

The following is a list of all hardware components in testing, and the quantity of each:

- 5x DS200
- 4x DS850
- 6x AutoMark A100
- 6x AutoMark A200
- 2x AutoMark A300
- 4x UPS
- 9x Headphones
- 3x Sip & Puff
- 1x Workstation Computers
- 1x Laptop Computer
- 1x Server
- 100x USB Transport Media (USB flash drive)
- 20x Compact Flash Card (CF)

2.2 Equipment and Accessories

This subsection categorizes the equipment the manufacturer has submitted for testing. Each test element is included in the list of the equipment required for testing of that element, including system hardware, general purpose data processing, communications equipment, and any required test instrumentation.

Table 2-1 EVS 5.0.0.0 Voting System Equipment Description

Equipment	Description	Serial Numbers
DS200 • Hardware v. 1.2 • Firmware v. 2.7.0.0	A digital scan paper ballot tabulator designed for use at the polling place level.	DS0110340034, DS0110340480 ES0108340085, ES0108330100 ES0108340579
AutoMARK A100 • Hardware v. 1.0 • Firmware v. 1.8.1.0	ADA Ballot Marking Device	AM0206443671,AM0106421217, AM0106431607,AM0106431648, AM0307430730, AM0308421809
AutoMARK A200 • Hardware v. 1.1, 1.3 • Firmware v. 1.8.1.0	ADA Ballot Marking Device	AM0208470626, AM0208970638, AM0206443734, AM0208470705, AM0208470828, AM0206442952
AutoMARK A300 • Hardware v. 1.3 • Firmware v. 1.8.1.0	ADA Ballot Marking Device	AM0307420270, AM0307431421
DS850 • Hardware v. 1.0 • Firmware v. 2.4.0.0	A high-speed, digital scan central ballot counter. During scanning, the DS850 prints a continuous audit log to a dedicated audit log printer and can print results directly from the scanner to a second connected printer.	DS850: DS8509420009, Cart: 57936-02, Laser Printer Oki B430dn: AF97052470A0, UPS APC-RS 1500: BB0932033646, Dot Matrix Printer Oki 420: AE72011853C0

Table 2-1 EVS 5.0.0.0 Voting System Equipment Description (Continued)

DS850 • Hardware v. 1.0 • Firmware v. 2.4.0.0	A high-speed, digital scan central ballot counter. During scanning, the DS850 prints a continuous audit log to a dedicated audit log printer and can print results directly from the scanner to a second connected printer.	DS850: DS8509420037 Cart: 59087.01 Cart02 Laser Printer Oki B431dn: AK16009803A0 UPS APC-RS 1500: 8B0848R49224 Dot Matrix Printer Oki 420: AE72011775C0
DS850 • Hardware v. 1.0 • Firmware v. 2.4.0.0	A high-speed, digital scan central ballot counter. During scanning, the DS850 prints a continuous audit log to a dedicated audit log printer and can print results directly from the scanner to a second connected printer.	DS850: DS8511090075 Cart: 59087.01 Cart03 Laser Printer Oki B430dn: AL03021036A0 UPS APC-RS 1500: JB1103003923 Dot Matrix Printer Oki 420: AE72036776C0
DS850 • Hardware v. 1.0 • Firmware v. 2.4.0.0	A high-speed, digital scan central ballot counter. During scanning, the DS850 prints a continuous audit log to a dedicated audit log printer and can print results directly from the scanner to a second connected printer.	DS850: DS858511090074 Cart: T58836.01 Cart01 Laser Printer Oki B430dn: AL03021044A0 UPS APC-RS 1500: BB0907016404 Dot Matrix Printer Oki 420: AE72011780C0
Ballot Box Hardware v. 1.2,1.3	Plastic Ballot Box	E076, E089, E099, T59087-Box 2, T59087-Box 3, T59087-Box 5
Ballot Box Hardware v. 1.0,1.1,1.2	Metal Box with Diverter	E015, E017, T59087 –Metal Box-12, T59087 – Metal Box-13
EMS Client/Reporting Workstation	Dell OptiPlex 980	3TZJFQ1
EMS Client/Reporting Laptop	Dell Latitude E6410	2FD65Q1
EMS Server	Dell PowerEdge T710	JPZ6VR1
Ethernet Switch	Dell Power Connect	HNC67M1
Network/Reports Printer	OKI B6300	502A2138674
Headphones	Avid FV-060	HP-57936-1, HP-57936-2, HP-57936-3, HP-57936-4, HP-57936-5, HP-57936-6, HP-57936-7, HP-57936-8 and HP-57936-9

In order to perform the software witness and trusted builds, the equipment in Table 2-2 shall be used:

Table 2-2 EVS 5.0.0.0 Voting System Build Machine Description

Equipment	Manufacturer	Version/Model	Serial Number	COTS/Non-COTS
Build 1	Dell OptiPlex 760	Processor: Intel Core 2 Duo E8400 Wolfdale Memory: 2x 2GB, 800 Mhz Ram Hard Drive Capacity: 80 GB	6D7DJG1	COTS

Table 2-2 EVS 5.0.0.0 Voting System Build Machine Description (Continued)

Build 2	Dell OptiPlex 760	Processor: Intel Duo Core E8400 Wolfdale Memory: 2x 2GB, 800 Mhz Ram Hard Drive Capacity: 80 GB	6DCKJG1	COTS
Build 3	Dell Precision T3500	Processor: Intel Xeon X5650 Westmere Memory: 3x 2GB, 1333 Mhz Ram Hard Drive Capacity: 160 GB	15TNMN1	COTS
Build 4	Dell Precision T3500	Processor: Intel Xeon X5650 Westmere Memory: 3x 2GB, 1333 Mhz Ram Hard Drive Capacity: 160 GB	15TMMN1	COTS

2.3 Test Support Materials

This subsection enumerates any and all test support materials needed to perform voting system testing. The scope of testing determines the quantity of a specific material required.

The test materials in Table 2-3 are required to support the EVS 5.0.0.0 System certification testing.

Table 2-3 EVS 5.0.0.0 System Test Support Materials

Test Material	Quantity	Make	Model
8 ½" X 11" Paper in Speed Loading Box (2700 Sheets)	4	Dot Matrix	951027
Security Seals	5000	Intab	800-0038R
Security Locks	20	E. J. Brooks	86022
	25	E. J. Brooks	6024
	50	American Casting Corp.	00561-03
ES&S Pens	20	BIC	Grip Roller
Security Sleeves	7	ES&S	PS-S7-936-XX(1-7) *
CF Card Reader	1	SanDisk	018-6305
Magnifier	3	---	---
Headphone Covers	30	---	---
Paddles (yes/no)	3	---	---
Transport Media (USB Flash Drives)	Delkin	512 MB Capacity	Wyle-assigned numbers: TM-XXX *
	Delkin	1.0 GB Capacity	Wyle-assigned numbers: TM-XXX *
	Delkin	2.0 GB Capacity	Wyle-assigned numbers: TM-XXX *
	Delkin	4.0 GB Capacity	Wyle-assigned numbers: TM-XXX *
	Delkin	8.0 GB Capacity	Wyle-assigned numbers: TM-XXX *
Compact Flash	SanDisk	1.0 GB Capacity	Wyle-assigned numbers: CF-XXX *
	SanDisk	2.0 GB Capacity	Wyle-assigned numbers: CF-XXX *
	Toshiba	1.0 GB Capacity	Wyle-assigned numbers: CF-XXX *

* Wyle will assign serial numbers to these items when testing begins.

2.4 Deliverable Materials

The materials listed in Table 2-4 are to be delivered as part of the EVS 5.0.0.0 System to the users.

Table 2-4 Deliverable Materials

Deliverable Material	Version	Description
ERM	8.6.0.0	EMS
ElectionWare	4.1.0.0	EMS
ES&S Event Log Service	1.5.0.0	EMS
VAT Previewer	1.8.1.0	EMS
DS200	Firmware 2.7.0.0; Hardware 1.2	Precinct ballot scanner
AutoMARK A100	Firmware 1.8.1.0; Hardware 1.0	Voter Assist Terminal
AutoMARK A200	Firmware 1.8.1.0; Hardware 1.1, 1.3	Voter Assist Terminal
AutoMARK A300	Firmware 1.8.1.0; Hardware 1.3	Voter Assist Terminal
DS850	Firmware 2.4.0.0; Hardware 1.0	Central ballot scanner
OKI Printer	B430dn	Laser Report Printer
OKI Printer	Microline 420	Dot Matrix Printer
Headphones	Avid FV-060	Stereo headphones
Voting System Overview EVS 5.0.0.0	15.0	TDP Document
ES&S ElectionWare 4.1 Vol I: Administrator Guide	4.8	TDP Document
ES&S ElectionWare 4.1 Vol II: Define Operator Guide	3.8	TDP Document
ES&S ElectionWare 4.1 Vol III: Design Operator Guide	3.2	TDP Document
ES&S ElectionWare 4.1 Vol IV: Deliver Operator Guide	5.6	TDP Document
ES&S ElectionWare 4.1 Vol V: Results User's Guide	1.5	TDP Document
ES&S DS200 System Operations Procedures	10.1	TDP Document
ES&S DS850 System Operations Procedures	2.4	TDP Document
AutoMark System Operations Procedures	5.0	TDP Document
ES&S ERM System Operations Procedures	8.6	TDP Document
Network Configuration Guide	3.1	TDP Document
ES&S EVS Event Logging Service System Operations Procedures	1.0	TDP Document
Voting System Security Specification EVS 5.0.0.0	3.1	TDP Document
Jurisdiction Security Procedures Template	1.0.0.1	TDP Document
Hardening Procedures for the EMS PC Guide	4.0	TDP Document

3.0 SOFTWARE

3.1 Software

Table 3-1 lists the software the manufacturer must submit for testing. This section defines the two types of software needed for testing:

- Software used for the testing of hardware, software, and security.
- Supporting software required for the test environment (operating systems, compliers, assemblers, database managers, and any other supporting software).

The EVS 5.0.0.0 software and firmware submitted for review are identified in Table 3-1.

Table 3-1 EVS 5.0.0.0 System Software and Firmware

Software/Firmware	Version	Description
ES&S Event Log Service	1.5.0.0	The ES&S Event Log Service is a Windows Service that runs in the background of any active ES&S Election Management software application to monitor the proper functioning of the Windows Event Viewer.
ElectionWare	4.1.0.0	ElectionWare Election Management System software for defining contents, candidates and ballot formats and performing results post-processing.
PaperBallot	3.1.0.0	The PaperBallot utilizes ElectionWare data originally sourced from external election data (Imported text file) or created within ElectionWare's Define Module. Ballot customization is accomplished with the Paper Ballot module.
Election Reporting Manager (ERM)	8.6.0.0	The Election Reporting Manager (ERM) generates paper and electronic reports for election workers, candidates, and the media. The Jurisdictions can use a separate ERM installation to display updated election totals on a monitor as ballot data is tabulated, and send results reports directly to media outlets.
Removable Media Service	1.4.0.0	Removable Media Service (RMS) is an application that runs in the background of the EMS client workstation and supports the graceful insertion and removal of election and results USB media.
DS200	2.7.0.0	The DS200 is a digital scan paper ballot tabulator designed for use at the polling place level.
DS850	2.4.0.0	A high-speed, digital scan central ballot counter. During scanning, the DS850 prints a continuous audit log to a dedicated audit log printer and can print results directly from the scanner to a second connected printer.
AutoMark	1.8.1.0	The AutoMARK™ Voter Assist Terminal is designed to help voters mark their election ballots when they are visually impaired, physically disabled, or more comfortable reading or hearing instructions and choices in an alternative language.
VAT Previewer	1.8.1.0	The VAT Previewer is an application within the EMS program that allows the user to preview audio text, and screen layout prior to burning election day media for the AutoMARK.

3.2 EVS 5.0.0.0 System Software

Each AutoMark, DS200, and DS850 unit is loaded with software applications and the machine's firmware. Each unit has specific software and firmware which has been configured specifically for the needs of the AutoMark, DS200, and DS850 units. All software and operating systems used for the AutoMark, DS200, and DS850 hardware was built at Wyle during a Witness Build, using code and scripts reviewed by Wyle.

EVS 5.0.0.0 System Software and Firmware

Software and Firmware	Language	EVS 5.0.0.0 Version
ElectionWare	Java	4.1.0.0
ElectionWare/SQL	SQL	4.1.0.0
ElectionWarePaperBallot.exe	C++	3.1.0.0
libCoNG.dll	C++	1.2.0.0
EssXML.dll	C++	4.1.0.0
Election Report Manager (ERM)	Cobol	8.6.0.0
CB_Evt.dll	C/C++	2.1.0.0
CB_XML.dll	C/C++	2.1.0.0
CB_XMLConv.dll	C/C++	2.1.0.0
ERMXMLConvDLL.dll	C++	3.1.0.0
ERMxmlData.dll	C++	2.1.0.0
ExitWin.exe	VB	2.1.0.0
MyDLL.dll	C	2.1.0.0
RegUtil.dll	C++	2.1.0.0
Shell.exe	C++	2.1.0.0
ShellSetup.exe	C++	2.1.0.0
RSACrypto.exe	C++	3.1.0.0
CreateLog.exe	C++	1.5.0.0
ESSEvt.dll	C++	1.5.0.0
ESSEvtA.dll	C++	1.5.0.0
ESSEvtMsg.dll	C++	1.5.0.0
EvtSvc.exe	C++	1.5.0.0
LogEvent.exe	C++	1.5.0.0
RmuCli.exe	C++	1.4.0.0
RmuDLL.dll	C++	1.4.0.0
RmuSvc.exe	C++	1.4.0.0
DS200	C	2.7.0.0
DS200 Presentation Layer	Java	2.7.0.0
PowerManagement_Msp430	C	1.2.6.0
Scanner_C8051	C	2.24.0.0
DS850 UI	C++	2.4.0.0
DS850 MCP	C++	2.4.0.0
DS850 CoNG _engine	C/C++	2.4.0.0
Amcode.exe	C++	1.8.1.0
AutoMark.exe	VB	1.8.1.0
AutoMark.dll	C#	1.8.1.0
AutomarkDataHelperLibrary.dll	C++	1.8.1.0
AutomarkEncoder.dll	C++	1.8.1.0
AutomarkService.exe	C++	1.8.1.0

EVS 5.0.0.0 System Software and Firmware (Continued)

AutomarkStartup.exe	C++	1.8.1.0
Software and Firmware	**Language**	**EVS 5.0.0.0 Version**
DiagnosticLogger.dll	C++	1.8.1.0
GETMARKS.dll	C++	1.8.1.0
MAKEBIN.EXE	C++	1.8.1.0
NonVolatileLibrary.dll	C++	1.8.1.0
OperationLogger.dll	C++	1.8.1.0
PEB.hex	C	1.70
RSASecurityLibrary.dll	C++	1.8.1.0
scandriver.dll	C++	1.549c
SCANNER.BIN	C	1.52c
ScannerPrinterLibrary.dll	C++	1.8.1.0
SecurityLibrary.dll	C++	1.8.1.0
SIB.hex	C	1.43
Ultra.S19	C	8.0.1

The EVS 5.0.0.0 System includes the following third-party software which has been delivered by ES&S or procured by Wyle:

EVS 5.0.0.0 System Third Party Software Descriptions

Software Product	Software Version	Filename	Hash Value
Microsoft Windows 7 Professional, 64-Bit SP1	6.1 (Build: 7601)	Original Disc	N/A
Microsoft Windows Server 2008 R2, SP2	6.1 (Build: 7601)	Original Disc	N/A
AVG Business 2012	2012	N/A	N/A
Cerberus FTP	4.0	N/A	N/A
Adobe Acrobat Standard	9.0	Original Disc	N/A
Liant RM/COBOL	12.06	N/A	N/A

3.3 EVS 5.0.0.0 System and Computer Configurations

The table below lists the hardware specifications that will be utilized for the ES&S EVS EMS.

Equipment	Manufacturer/Model	Hardware Specifications	Service Tag	COTS/non-COTS
SERVER 1	Dell PowerEdge T710	Intel Xeon CPU E5645 @ 2.40GHz (2 processors) 12.0 GB Installed RAM HD Capacity 300 GB	JPZ6VR1	COTS
DESKTOP 1	Dell OptiPlex 980	Intel Core i5 CPU 650 @ 3.20 GHz 4.0 GB Installed RAM HD Capacity 320 GB	3TZJFQ1	COTS

EVS 5.0.0.0 System and Computer Configurations (Continued)

DESKTOP 2	Dell OptiPlex 780	Intel Core 2 Duo CPU E7500 @ 2.93 GHz 4.0 GB Installed RAM HD Capacity 160 GB	5T79QM1	COTS
LAPTOP 1	Dell Latitude E6410	Intel Core i5 CPU M580 @ 2.67 GHz 4.00 GB Installed RAM HD Capacity 250 GB	2FD65Q1	COTS

Dell Original Configuration (Server)

Service Tag:	JPZ6VR1
System Type:	PowerEdge T710
Ship Date:	11/23/2011
Dell IBU:	Americas

Qty	P/N	Part Description
1	5DWVW	MODULE…, PRINTED WIRING ASSY…, PLANAR…, PET710, TRUSTED PLATFORM MODULE…, V2
1	1CTXG	Assembly, Printed Wiring Assy, Planar, T710, Third Party Maintenance, INTE, V2
1	F864K	BASE (ASSEMBLY OR GROUP)…, SERVER, SERVER CHASSIS…, PET710
1	MHH67	MODULE…, ASSEMBLY…, CABLE…, SERIAL ATTACHED SCSI…, 6G, T710, 2
1	0FH2D	Assembly, Cable, 6GB, Serial Attached Scsi, CNTL 1, T710
1	PG9KK	ASSEMBLY…, CABLE…, 6GB, SERIAL ATTACHED SCSI…, CNTL 0, T710
1	N549M	Ship Group, PET710, Dell Americas Organization
1	1323	INFORMATION…, NO ITEM
1	2260R	PREPARATION MATERIAL…, DEVIATION…, SERVICE CHARGE…, INCRS #1
1	3H0C4	PLACEMAT…, SETUP…, POWEREDGE…, 3, WEST…
1	J894K	GUIDE…, PRODUCT…, INFORMATION…, SERI, DAO/BCC
1	N732H	GUIDE…, GETTING STARTED…, PT710, DAO/BCC
1	P071K	GUIDE…, PRODUCT…, INFORMATION…, WSI, PE/PV
1	P136K	MODULE…, CHASSIS…, Tower…, METAL…, 3.5, PET710
1	7DV8N	ASSEMBLY…, CHASSIS…, Tower…, 3.5, PET710, V2
1	NPTFH	Assembly, Carrier, Mounting, Blank, Hard Drive, 3.5, V3
1	T758P	Module, Information, Tower Chassis
1	W885J	MODULE…, INFORMATION…, MEMORY BOARD, MEMORY…, CHAN3
1	WYT4N	MODULE…, DUAL IN-LINE MEMORY MODULE…, 12GB, 1R, 6X2G, RDIMM, LOW VOLTAGE…
1	MVPT4	Dual In-Line Memory Module, 2G, 1333, 1RX8, 8, 240, Regulatory, Low Voltage
1	X539J	MODULE…, INFORMATION…, MEMORY BOARD, MEMORY…, CENTRAL PROCESSOR UNIT…, 2 PCE
1	PY182	MODULE…, INFORMATION…, SALES…, LAN ON MOTHERBOARD…, ON BOARD…
1	JGGTG	MODULE…, PROCESSOR…, E5645, 2.4, XWM, 80W
1	01M26	Processor, E5645, 2.4/5.86, 12MB, Xeon Westmere Efficient Performance, B1
1	MRX91	MODULE…, PROCESSOR…, E5645, 2.4, XWM, 80W, SECOND…
1	01M26	Processor, E5645, 2.4/5.86, 12MB, Xeon Westmere Efficient Performance, B1
1	T982P	MODULE…, THERMAL…, SERVER, SERVER CHASSIS…, PET610, DUAL-PRC
1	KW180	Assembly, Heatsink, Processor PET610
1	DN458	MODULE…, INFORMATION…, DELLSTAR, MULTISELECT
1	C546R	MODULE…, ASSEMBLY…, CABLE…, 5P, BATTERY…, PERC5I
1	YH927	Assembly, Cable, 5P, Battery PERC5I, PE840
1	W4V50	MODULE…, CARD (CIRCUIT)…, CONTROLLER…, H700I, 512
1	XXFVX	Assembly, Card, PERCH700-INT, 512M, Serial Attached Scsi
1	N754K	MODULE…, INFORMATION…, ENABLE PERFORMANCE
1	KD483	MODULE…, SOFTWARE…, NO-OS
1	U285K	MODULE…, INFORMATION…, IDRAC6 EXPRESS

Dell Original Configuration (Server) (Continued)

1	U146K	MODULE…, CABLE…, Serial ATA…, OPTION…, T610
1	GW837	Assembly, Cable, Serial Ata Option, T610
1	C20CH	MODULE…, DVD+/-RW…, 16X, Serial ATA…, HALF HEIGHT…, HITACHI LG DATA STORAGE…
1	YNX23	Assembly, Dvd+/-Rw, 16X, Half Height, Hitachi Lg Data Storage, Enterprise Systems Group
1	W838P	MODULE…, MEDIA…, DIGITAL VIDEO DISK DRIVE…, DOCUMENT OBJECT MODEL…, PET710
1	X643K	Module, Information, C9, MSSR1R5 PET710
1	F356K	MODULE…, RACK RAIL…, NO RAILS, 3U+
1	73HPG	MODULE…, POWER SUPPLY…, 1100W, REDUNDANT…, LATIN/LATIN AMERICA…, V2
1	TCVRR	Power Supply, 1100W, Redundant, LITEON
1	F928P	MODULE…, CORD…, POWER…, 15A, 3M, C13, UNITED STATES…
1	0R215	Cord, Power, 15A, 125V, 10, 5-15/C13
1	F928P	MODULE…, CORD…, POWER…, 15A, 3M, C13, UNITED STATES…
1	0R215	Cord, Power, 15A, 125V, 10, 5-15/C13
1	N445N	Display, Flat Panel Display, 17 E170SB, Black, Dell Americas Organization
1	J56FG	MODULE…, MOUSE…, UNIVERSAL SERIAL BUS…, SHIP IN BOX…, LOGITECH…, MS111
1	9RRC7	Kit, Mouse, Universal Serial Bus, Point Of Sale, Logitech, MS111
1	TFR2F	MODULE…, KEYBOARD…, 104, UNITED STATES…, KB212B, SHIP IN BOX…
1	194XT	Keyboard, 104, United States, KB212B, Darfon Electronics, Corp
1	47VHW	System Integration, Module Information, MIAS, PN2
1	118UX	System Integration, InformationMIAS, Code
1	Y326D	System Integration, Order Ready, Module, Information, Label, Medium, PROENT
1	C411D	SYSTEM INTEGRATION…, ORDY, INFORMATION…, LABEL…, MEDIUM…, PROENT
1	G1688	SYSTEM INTEGRATION…, INFORMATION…, VALIDATOR…, TAG/TAGGING…, QUICK
1	R1480	System Integration, InformationValidator, Chassis Def
1	7CV6H	MODULE…, HARD DRIVE…, 300G, SAS6, 15K, 3.5, SEAGATE…
1	F238F	Assembly, Carrier, Hard Drive SAS-SATAU, 3.5
1	F617N	HARD DRIVE…, 300G, SAS6, 15K, 3.5, SEAGATE…, EAGLE…

Dell Original Configuration (Desktop)

Service Tag:	3TZJFQ1
System Type:	OptiPlex 980
Ship Date:	04/27/2011
Dell IBU:	Americas

Qty	P/N	Part Description
1	JD509	LABEL..., REGULATORY..., SIDE, UNIVERSAL..., BLANK ..., V2
1	T845M	INSTRUCTION..., TRIGGER..., SVC TAG
1	MY297	Label, Fascia, Intel, CARTON
1	6337P	LABEL..., SVC TAG/EXPRESS CODE, LATC
3	0U781	SCREW..., M3X5MM, HX, THREAD FORMED..., ZINC PLATED STEEL...
1	85KRY	ASSEMBLY..., DVD+/-RW..., 16X, HALF HEIGHT..., BARE, PLDS
1	D682M	SHIPPING MATERIAL..., MASKING, 9X8, BJMT
1	PM396	SHIPPING MATERIAL..., BOX, SYSTEM..., TRANSFORMER SKY DIVE MINITOWER..., OPTIPLEX...

Dell Original Configuration (Desktop) (Continued)

1	3RMPG	LABEL..., INTEL..., DESKTOP..., CI5, VPRO
1	D422R	ASSEMBLY..., CHASSIS..., PWA INTEGRATED..., BJMT, 980, ENVIRONMENTAL PROTECTION AGENCY..., THIRD PARTY MAINTENANCE...
1	H9361	Assembly, Cable, Video, DUAL Digital Video Interface, Lead Free
1	30PVG	Label, Microsoft, Desktop, WindowsSeven
1	N374R	ASSEMBLY..., HEATSINK..., SHROUD..., MAINSTREAM..., BJMT, 98
1	TKDVY	HARD DRIVE..., 320GB, S3, 7.2K, SGT-PHAR 6G
1	J251N	KIT..., SOFTWARE..., POWERDVD..., 8.2, BUSINESS...
2	1N7HK	Dual In-Line Memory Module, 2G, 1333, 128X64, 8, 240, 1RX8
1	MW501	PLUG..., VIDEO, JACK, BLACK..., MSMT/MCSF
1	FXJCH	INSTRUCTION..., DEV-TO-BJMT-L5+, ENVIRONMENTAL PROTECTION AGENCY..., 980
1	C158J	KIT..., DOCUMENTATION..., SERI/WSI, ENGLAND/ENGLISH..., DAO/BCC
1	23501	Label, Barcode, System, Box, Generic
1	2Y277	Shipping Material, Filler, Ramjet, SX260, World Wide
1	KXGVD	Label, Certificate Of Authenticity, Operating System, W7P3/6
1	U989P	Assembly, Speaker, 1W, Round, 12.8CBL
1	TY130	Label, Information, Management, AMT/DASH/VPRO
1	P34RV	Kit, Software, Powerdvd, 8.3, True Theatre High Definition
1	X398D	Card, Graphics, 256, Full Height OUGA6
2	0RRV0	Display, Flat Panel Display, 22, P2211H, Mexico
1	5120P	Cord, Power, 125V, 6Feet, SJT..., Unshielded
1	D070J	SHIPPING MATERIAL..., CUSHION..., BJMT, DELL AMERICAS ORGANIZATION...
1	GHFR0	Kit, Software, W7P64, Multiple User Interface, Non European
1	MDR7N	Kit, Media, Digital Video Disk Drive, Resource Dvd, 980
1	UC635	ASSEMBLY..., SWITCH/SWITCHING..., PUSHBUTTON..., INTRUSION..., GX520
1	VP76H	Processor, I5-650, 3.2, 4MB, Clarkdale, 73W, K0
1	F153G	Plug, Data Port, JACK, OptiPlex 960
1	H7770	SHIPPING MATERIAL..., BOX..., OPTION..., TRANSFORMER JAZZ DESKTOP..., ARCEL

Dell Original Configuration (Laptop)

Service Tag:	2FD65Q1
System Type:	Latitude E6410
Ship Date:	04/27/2011
Dell IBU:	Americas

Qty	P/N	Part Description
1	UK717	Keyboard, 83, United States English, Black, EMD
1	667CC	Assembly, Base, Notebook, I, Third Party Maintenance, E, E6410
1	XDNFF	HARD DRIVE..., 250GB, S2, 7.2K, P11, SGT-HOLL
1	Y42JK	Assembly, Palmrest, W/O-CSC, UP, E6410
1	TNP01	Assembly, Heatsink, Central Processor Unit, Notebook, Unified Memory Architecture, E6410
1	T8K98	Bezel, Liquid Crystal Display, Plastic, W/MIC, E6410
1	HVHC0	Battery, PRIM, 90WHR, 9C, Lithium, Near Line Sas, SNY
1	TYXD9	Display, Flat Panel Display, 22, P2211H, Dell Americas Organization
1	CR5M3	Liquid Crystal Display, 14.1WXGA, Light Emitting Diode, Embedded Display Port, AG, Systems Management Solutions, V2
1	MT664	Bracket, Support, Right, Metal Light Emitting Diode Roush/Heelys

Dell Original Configuration (Laptop) (Continued)

1	WTC0V	ADAPTER..., ALTERNATING CURRENT..., 90W, DELTA - AC ADAPT..., 3P, WORLD WIDE..., COST REDUCED..., M09
1	4Y03H	Latch, Optical Device Drive, Random Access Memory
2	F073F	Dual In-Line Memory Module, 2GB1333MHZ, 256X64, 8K, 200
3	2864D	Screw, M3X3, K SCREW HEAD..., MICROSOFT..., BLACK OXIDE...
1	FX429	CORD..., Power, 125V, 2.5A, 1M, C5 E, United States
1	8HRNK	Assembly, Microphone, ARRAY, Liteon, M10
1	8XFGP	PROCESSOR..., I5-580M, 2.66, 3MB, ARN, K0
1	C158J	KIT..., DOCUMENTATION..., SERI/WSI, ENGLAND/ENGLISH..., DAO/BCC
1	WT212	Bracket, Support, Left, Metal Light Emitting Diode Roush/Heelys
1	X0T6T	Bezel, Optical Device Drive, Dvd+/-Rw, Random Access Memory
1	TWC31	Cover, Light Emitting Diode, Plastic, RMA
1	WM82H	Assembly, Cover, Back, Liquid Crystal Display, SILVER, E6410
1	P53MW	Dvd+/-Rw, 8X, 9.5, Tray, EMOD, Toshiba Samsung Storage Technology
1	WHDPC	Card, Wireless, Half Mini-Card, DW1501, 4313

4.0 TECHNICAL DATA PACKAGE (TDP)

4.1 Required Documents for PCA

The following documents are required during the performance of the Physical Configuration Audit to ensure that the manufacturer's TDP provides sufficient instruction for a user to install, validate, operate, and maintain the voting system. Documentation regarding the manufacturer's Configuration Management Plan and Software and Design Specifications was used during the Source Code review to ensure that the software conformed to the manufacturer's specifications. The following table lists the documents utilized during the Physical Configuration audit:

Table 4-1 EVS 5.0.0.0 TDP Documents

EVS 5.0.0.0 TDP Documents	Version	Doc. No.	Document Code
Voting System Overview	15.0	01-01	EVS5000_OVR00
System Functionality Description			
System Functionality Description – Voting System	8.0	02-01	EVS5000_SFD00
System Hardware Specification			
System Hardware Specification – DS850	3.0	03-01	EVS5000_SHS00_DS850
System Hardware Specification – DS200	2.0	03-02	EVS5000_SHS00_DS200
AutoMARK™ System Hardware Overview	5.0	03-04	AutoMARK™_ESS_System_Hardware_Overview_AQS-18-5002-000-S
AutoMARK™ System Hardware Specification	5.0	03-05	AutoMARK™_ESS_System_Hardware_Specification_AQS-18-5000-001-F
Software Design and Specification			
Software Design and Specification – ES&S Event Log Service	1.0	04-01	EVS5000_SDS00_UELS
Software Design and Specification - ElectionWare	7.0	04-02	EVS5000_SDS00_ElectionWare
Software Design and Specification – ERM	3.0	04-03	EVS5000_SDS00_ERM
Software Design and Specification – DS850	10.0	04-04	EVS5000_SDS00_DS850
Software Design and Specification – DS200	7.0	04-05	EVS5000_SDS00_DS200
Software Design and Specification – AutoMARK™	1.8	04-06	EVS5000_SDS00_AutoMARK™ SDS Overview
System Test/Verification Specification			
Voting System Test Plan	4.0	05-01	EVS5000_STP00

Table 4-1 EVS 5.0.0.0 TDP Documents (Continued)

Test Cases - ElectionWare: Manage	4.1.0.0	05-02	EVS5000_TC00_ElectionWare01_Manage
Test Cases - ElectionWare: Define	4.1.0.0	05-03	EVS5000_TC00_ElectionWare02_Define
Test Cases - ElectionWare: Design	3.3	05-04	EVS5000_TC00_Electionware03_Design
Test Cases - ElectionWare: Deliver	4.1.0.0	05-05	EVS5000_TC00_Electionware04_Deliver
Test Cases - ElectionWare: Resolve	4.2.0.0	05-06	EVS5000_TC00_Electionware05_Resolve
Test Cases - ERM	8.6.0.0	05-07	EVS5000_TC00_ERM
Test Cases - DS850	2.4.0.0	05-08	EVS5000_TC00_DS850
Test Cases - DS200	2.7.0.0	05-09	EVS5000_TC00_DS200
Test Cases - AutoMARK™	1.8.1.0	05-10	EVS5000_TC00_AutoMARK™
EVS 5.0.0.0 TDP Documents	Version	Doc. No.	Document Code
System Security Specification			
System Security Specification	3.1	06-01	EVS5000_SSS00
AutoMARK™ System Security Specifications	6.0	06-02	AutoMARK™ ESS System Security Specification AQS-18-5002-001-S
System Operations Procedure			
System Operations Procedures - UELS	1.0	07-01	EVS5000_SOP00_ELS
EVS 5.0.0.0 TDP Documents	**Version**	**Doc. No.**	**Document Code**
User's Guide- ElectionWare Admin	4.8	07-02	EVS5000_SOP00_ElectionWare02_Admin
User's Guide- ElectionWare Define	4.0	07-03	EVS5000_SOP00_ElectionWare02_Define
User's Guide - ElectionWare Design	3.2	07-04	EVS5000_SOP00_ElectionWare03_Design
User's Guide - ElectionWare Deliver	5.6	07-05	EVS5000_SOP00_ElectionWare04_Deliver
User's Guide - ElectionWare Results	1.5	07-06	EVS5000_SOP00_ElectionWare05_Results
User's Guide - ERM	8.6	07-07	EVS5000_SOP00_ERM
Operator's Guide - DS850	11.4	07-08	EVS5000_SOP00_DS850
Operator's Guide - DS200	10.1	07-09	EVS5000_SOP00_DS200
System Operations Procedures - AutoMARK™	5.0	07-10	EVS5000_SOP00_AMVAT
Network Configuration Guide	3.1	07-12	EVS5000_SOP00_NetworkConfigGuide
System Maintenance Manuals			
Maintenance Guide- DS850	3.1	08-01	EVS5000_SMM00_DS850
Maintenance Guide- DS200	3.1	08-02	EVS5000_SMM00_DS200
Maintenance Guide- AutoMARK™	4.0	08-03	EVS5000_SMM00_AMVAT
Personnel Deployment and Training			
Personnel Deployment and Training Program	1.0	09-01	ESSSYS_T_D_1000_TrainingProgram
Configuration Management Plan			
ES&S Configuration Management Program	1.0	10-1	ESSSYS_CM_P_1000_ESSCMProgram
CM Plan Appendices	---	10-2	Multiple Documents
QA Program			
Manufacturing Quality Assurance Plan	1.0	11-01	ESSSYS_M_P_1000_MNFQualityAssurancePlan
Engineering Change Order Process	1.0	11-02	ESSSYS_M_P_0500_ECOProcess
Software Quality Assurance Program	1.0	11-03	ESSSYS_Q_P_0100_SoftwareQualityAssuranceProgram
Other TDP Documents			
ES&S Ballot Production Guide	4.0	13-01	U3400R1_ORPT02_BallotProductionGuide

5.0 Conclusion

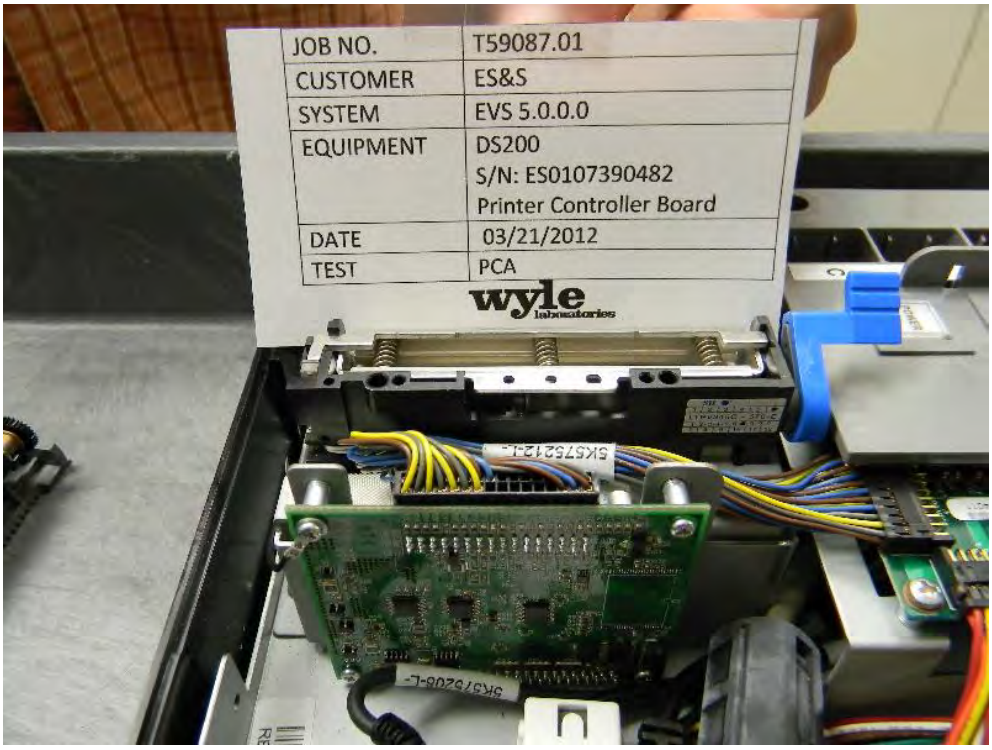
All Hardware and Software undergoing the Certification Process has been inspected. Photographs were taken of hardware components and are included in Appendix A of this document. Serial numbers of all hardware have been recorded as have version numbers for all software. Hardware and software changes that occur throughout the certification process will be recorded and tracked until testing is concluded.

APPENDIX A
PHOTOGRAPHS

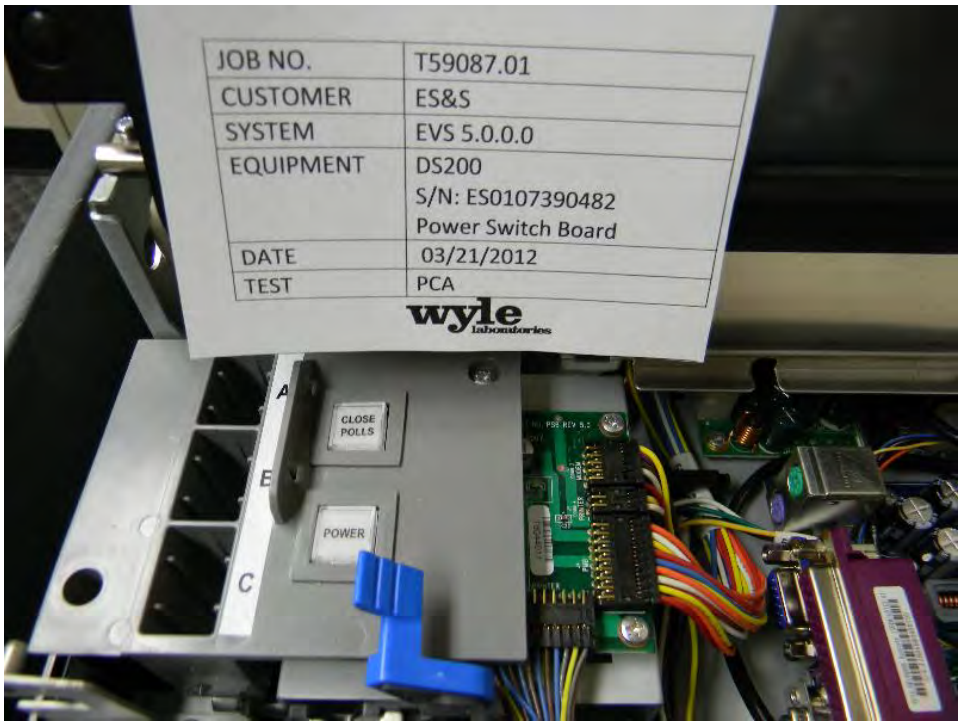
DS200
(Unit on tabletop in closed transport mode)

DS200
(Unit on tabletop in open mode)

DS200 Mother Board



DS200 Printer Controller Board



DS200 Power Switch Board

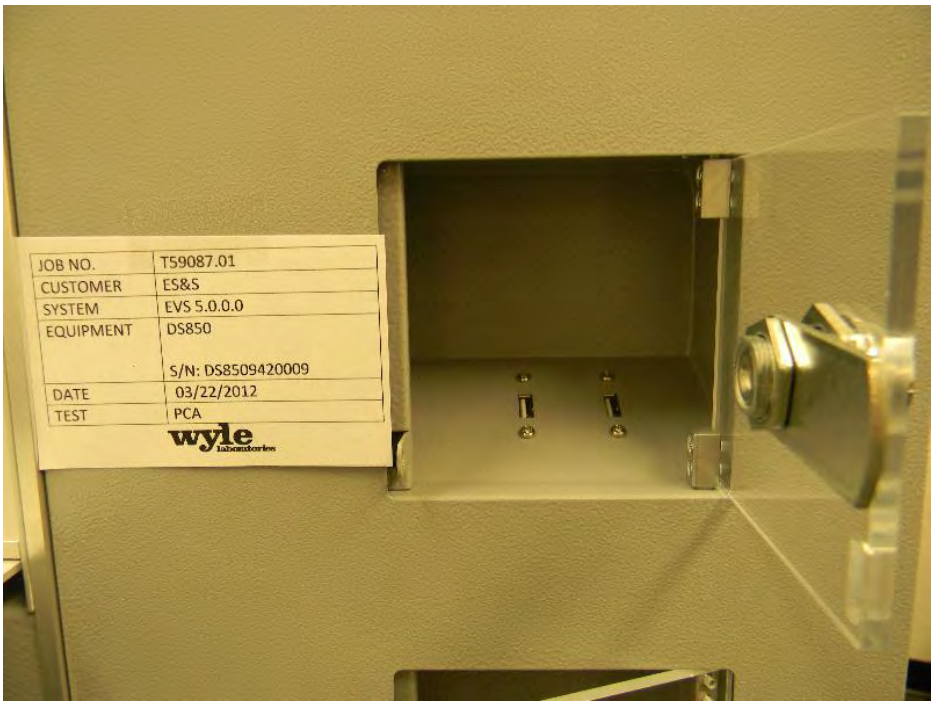
DS850 Front View

DS850 Front View Close Up

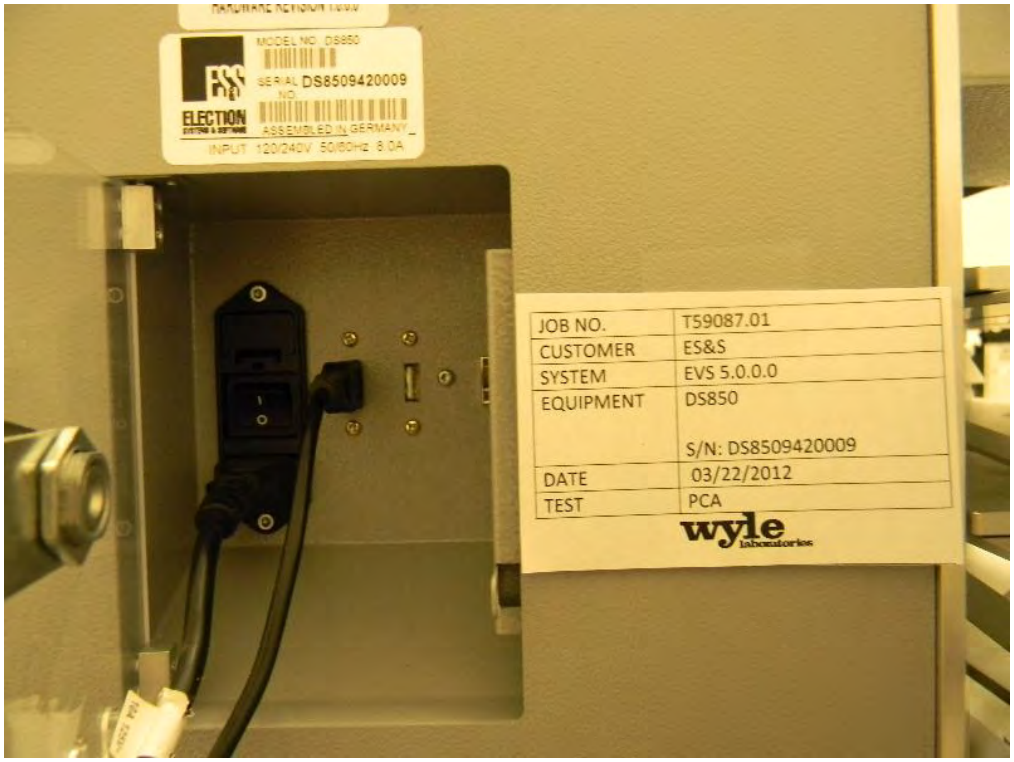
DS850 Rear View

DS850 Rear View with Backdoor Open

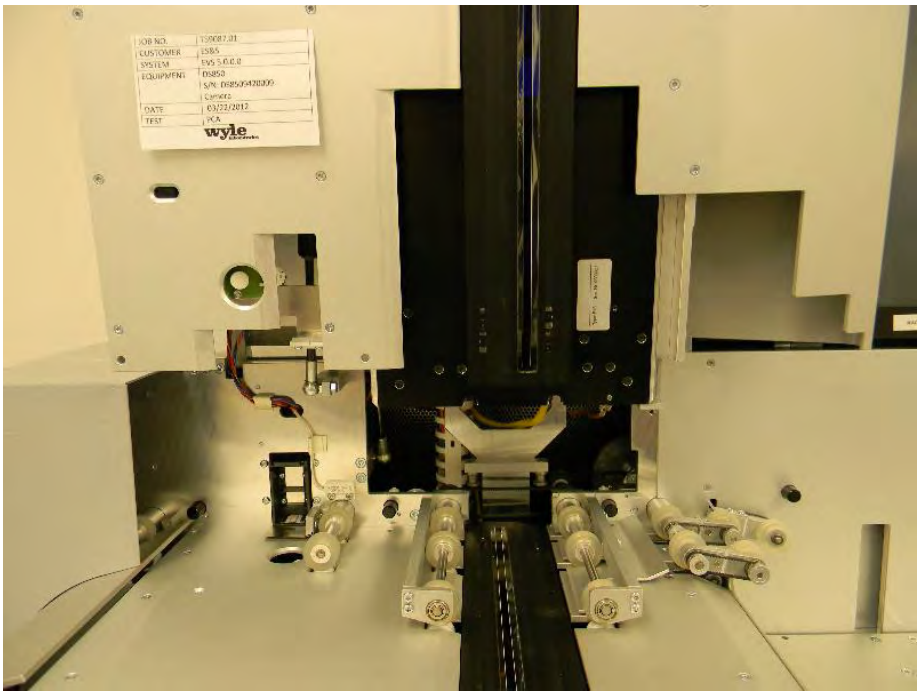
DS850 Side View



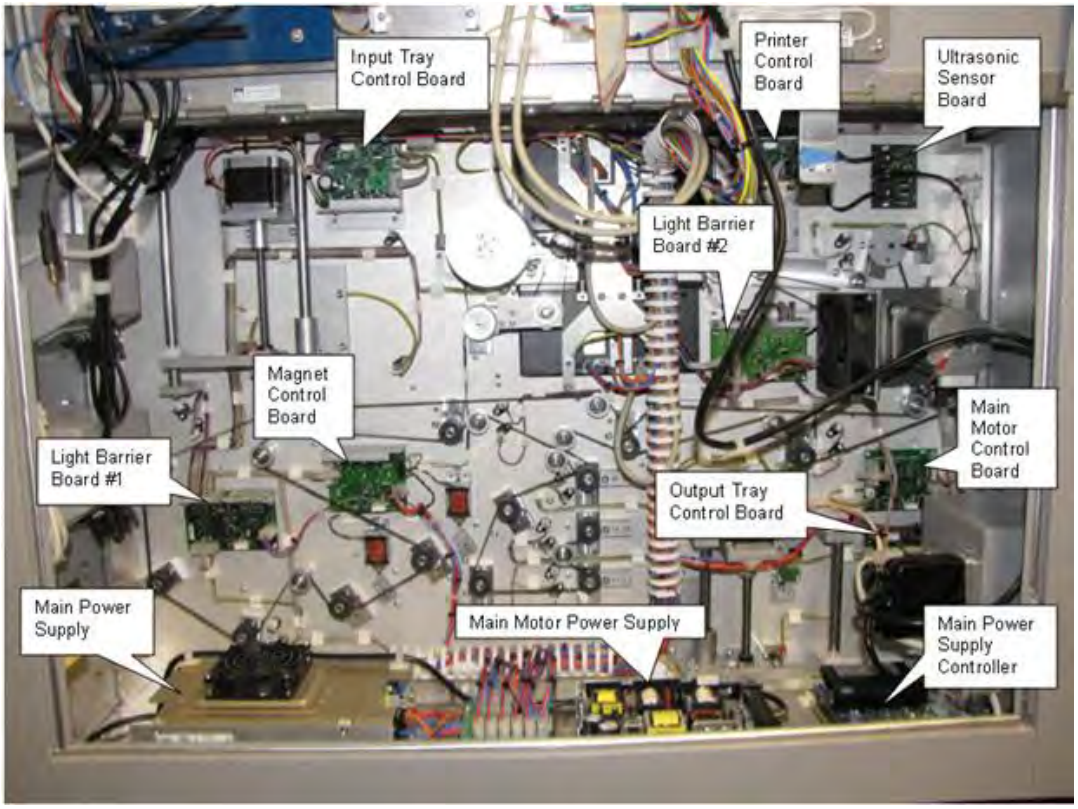
DS850 Side View Close Up



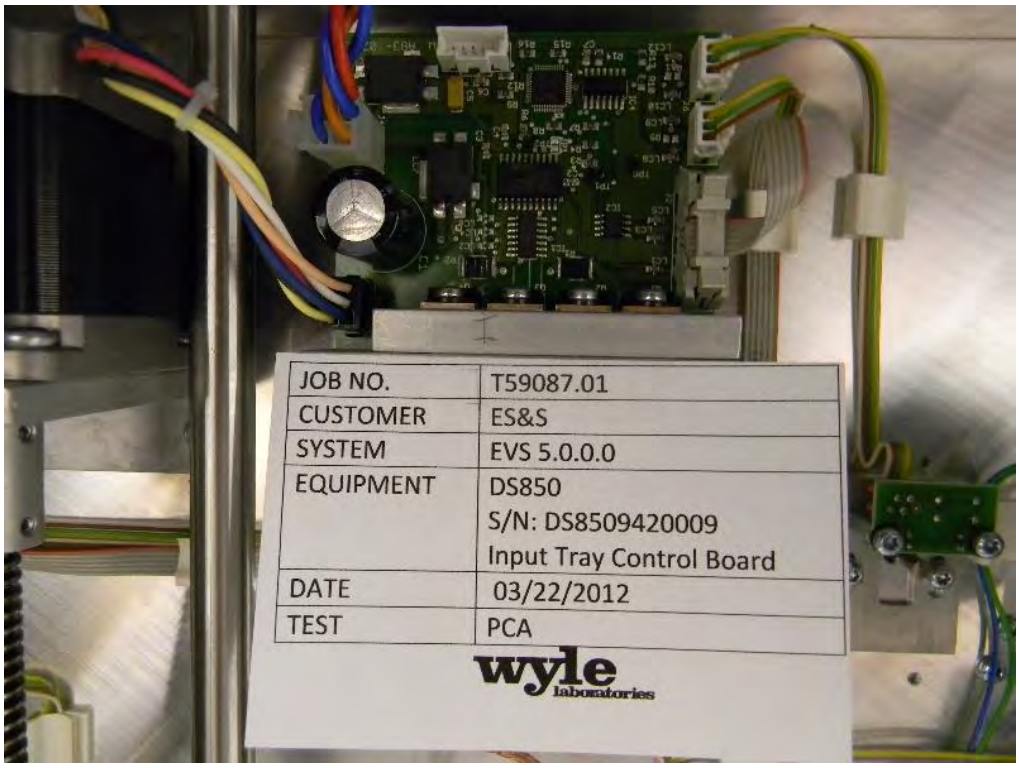
DS850 Side View Single Port Close Up



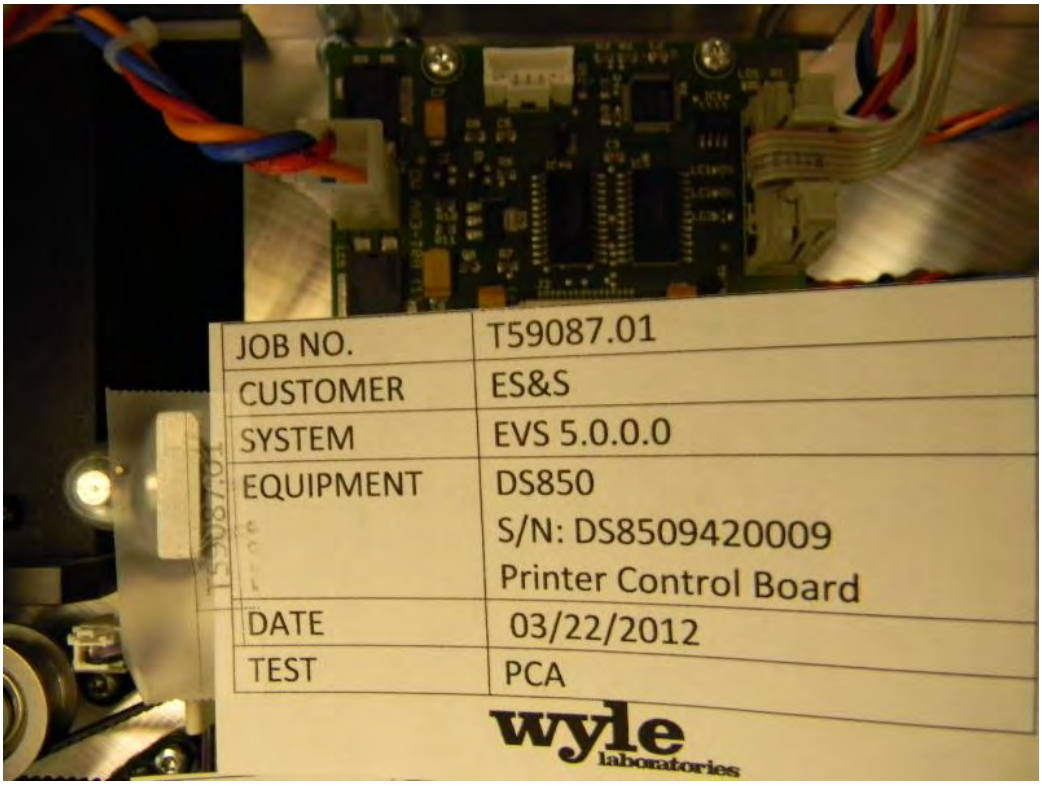
DS850 Camera Close Up



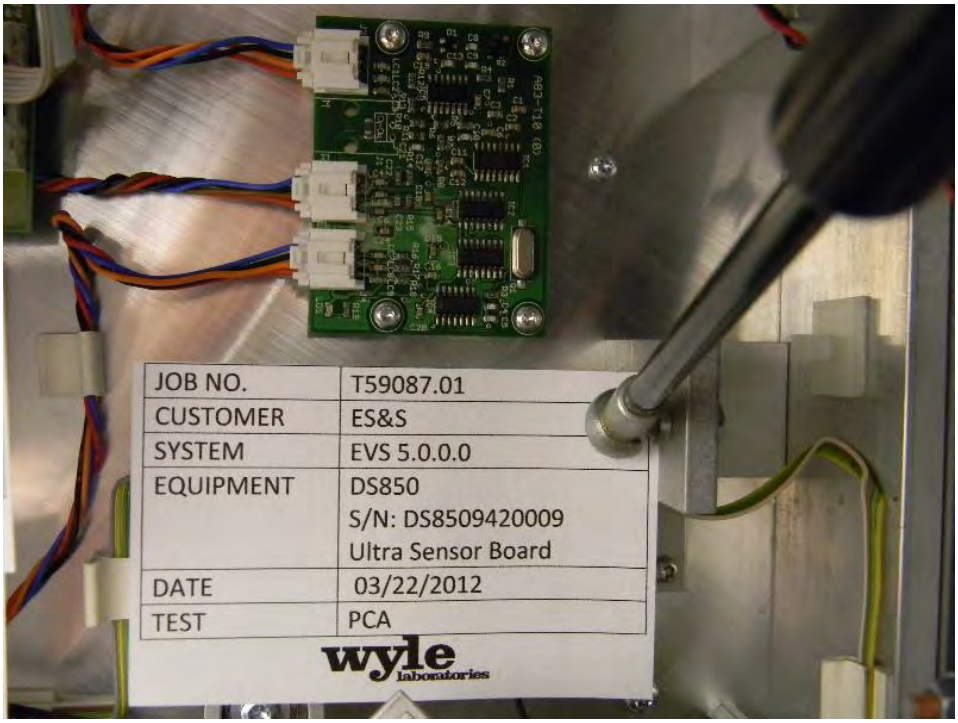
The following picture identifies the hardware on the back wall of the scanner.
From ES&S DS850 Maintenance Guide Document Version 1.0 Version Release: v.2.4



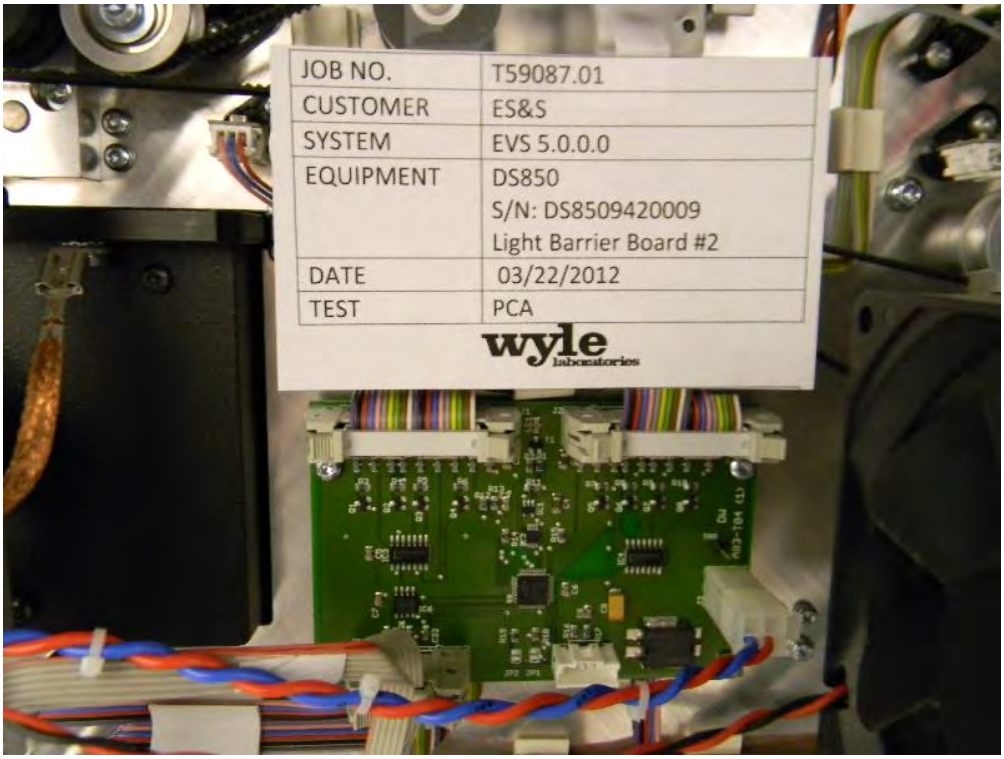
Input Tray Control Board



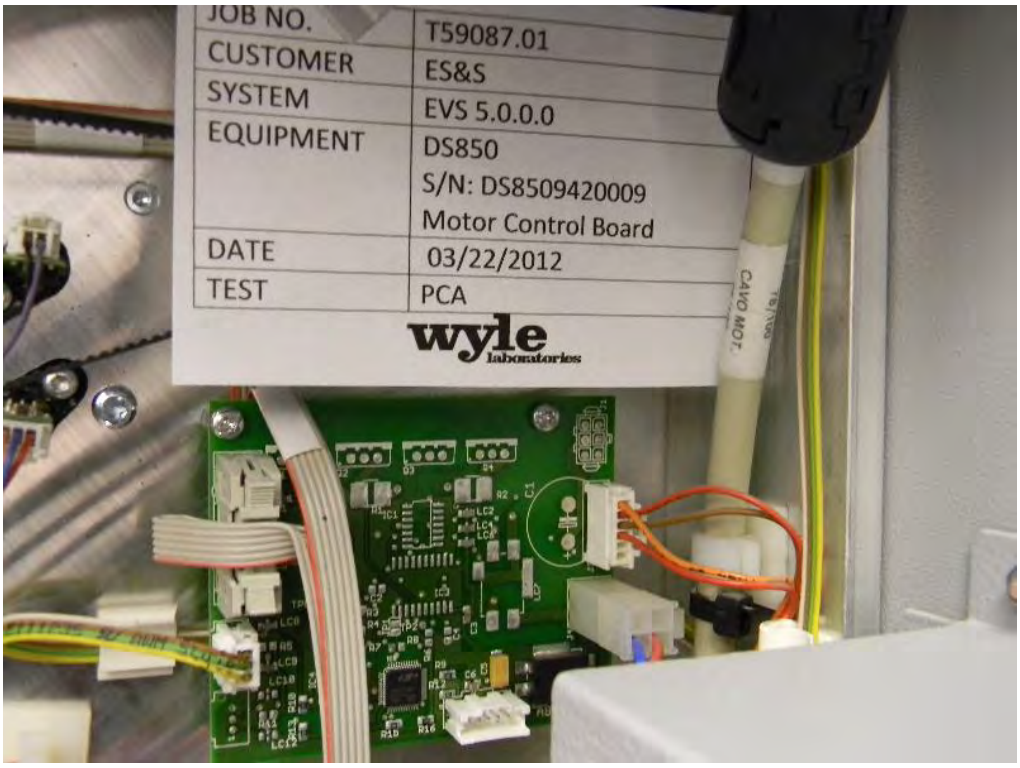
Printer Control Board



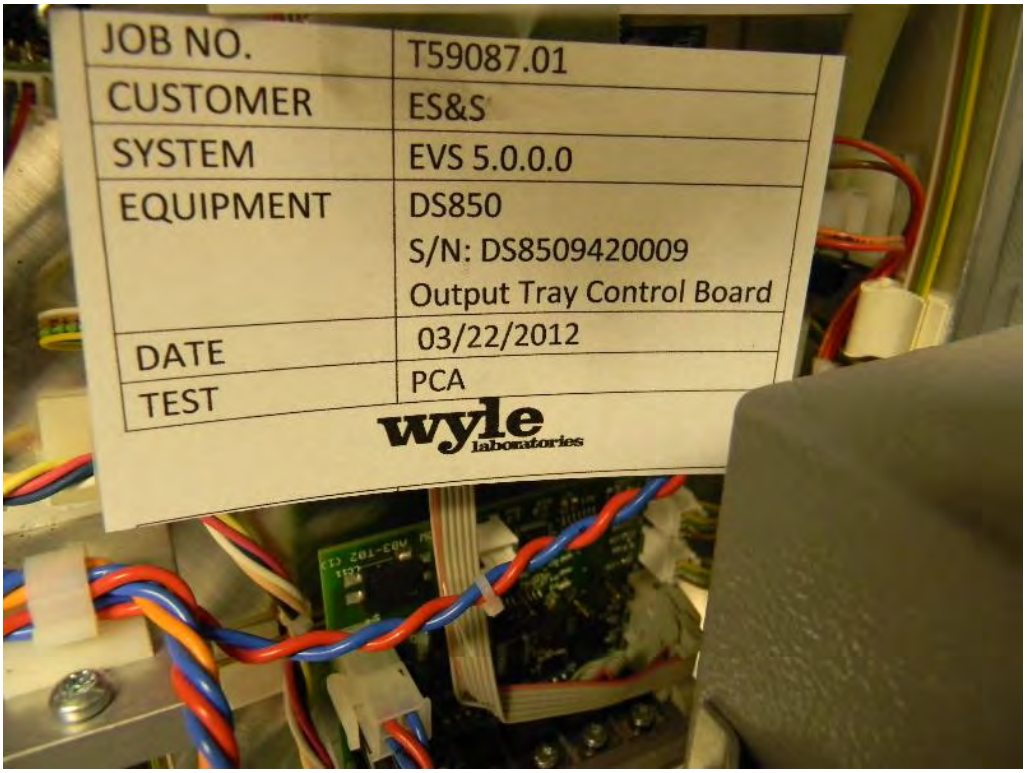
Ultra Sensor Board



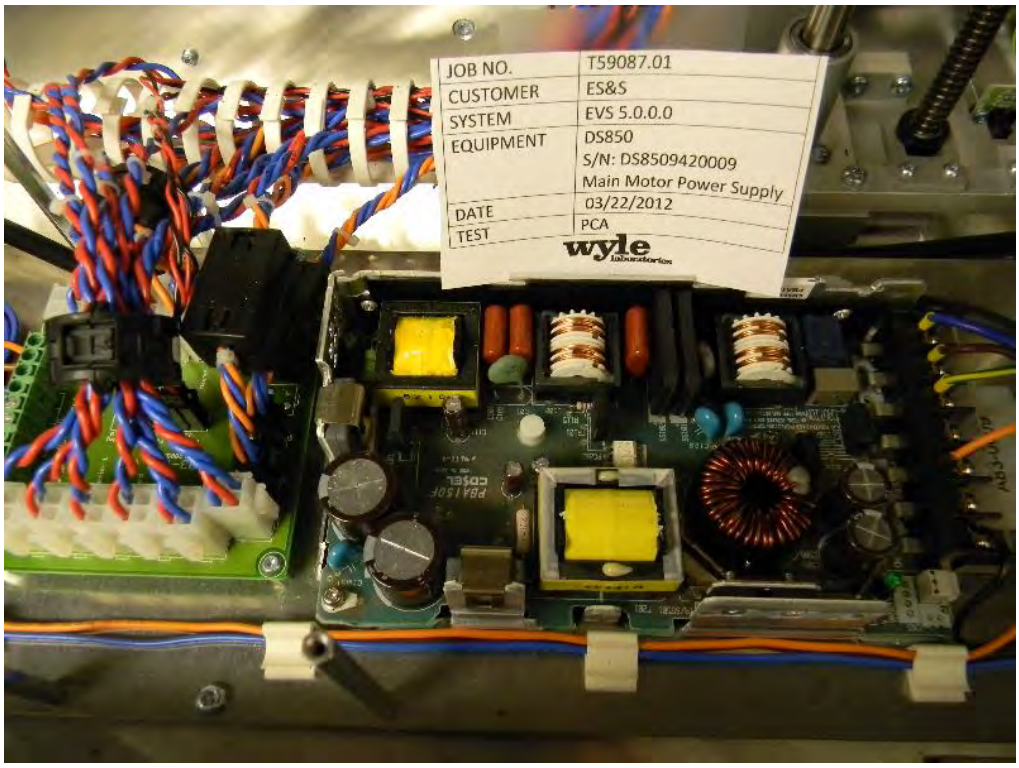
Light Barrier Board No.2



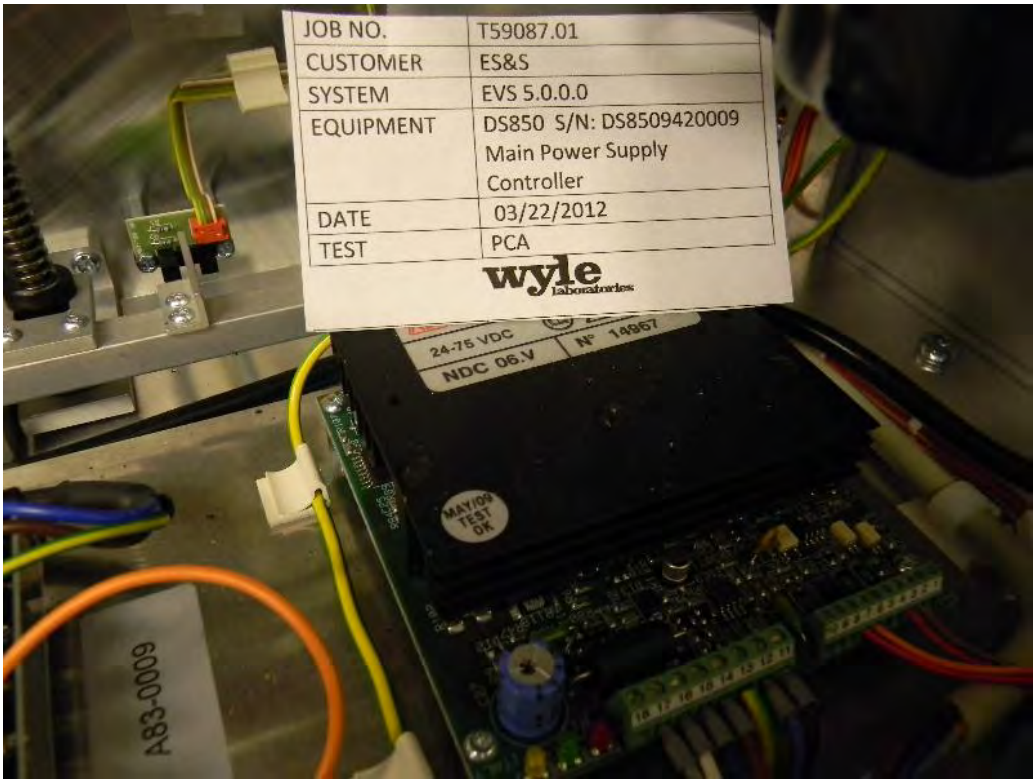
Main Motor Control Board



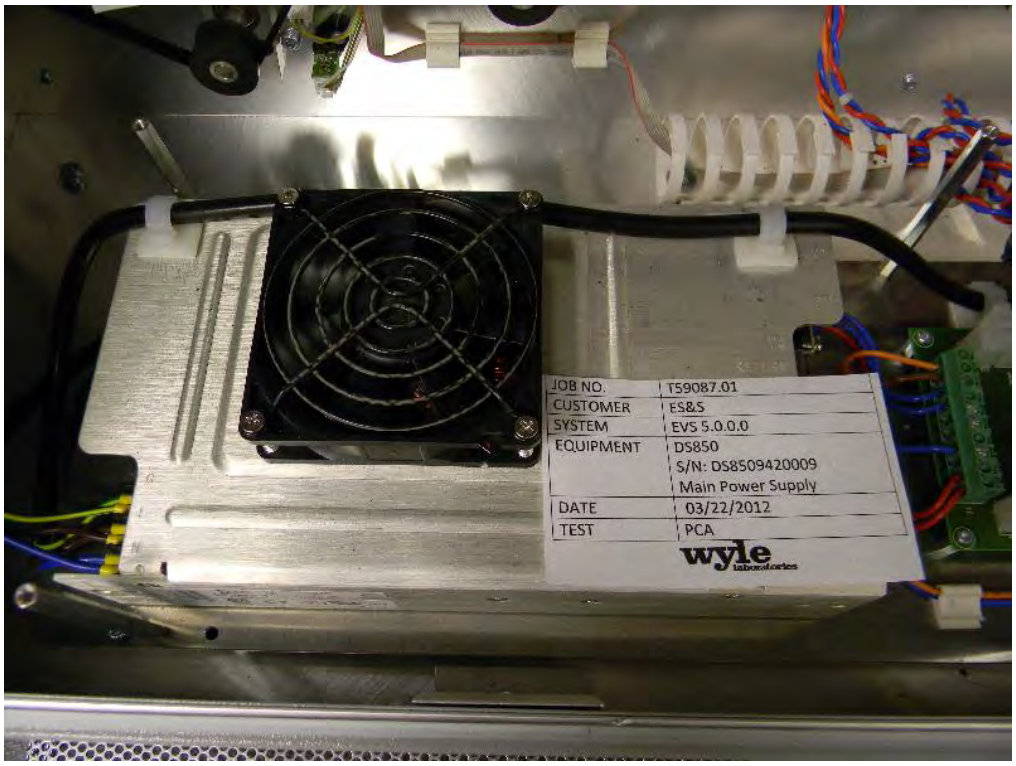
Output Tray Control Board



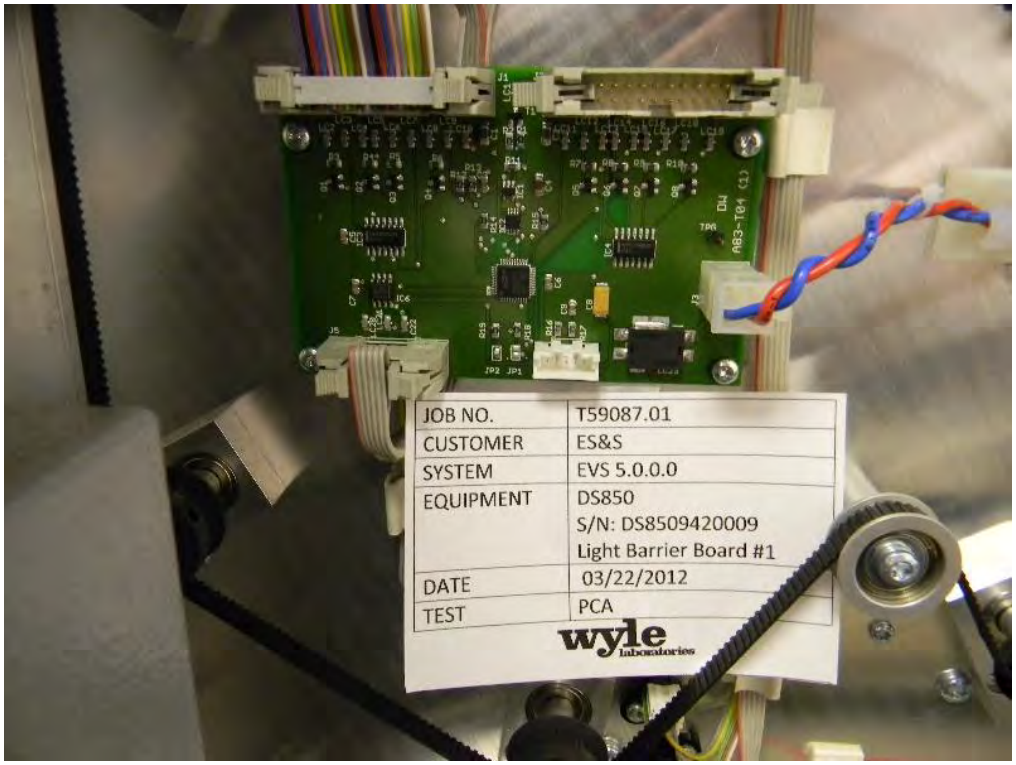
Main Motor Power Supply



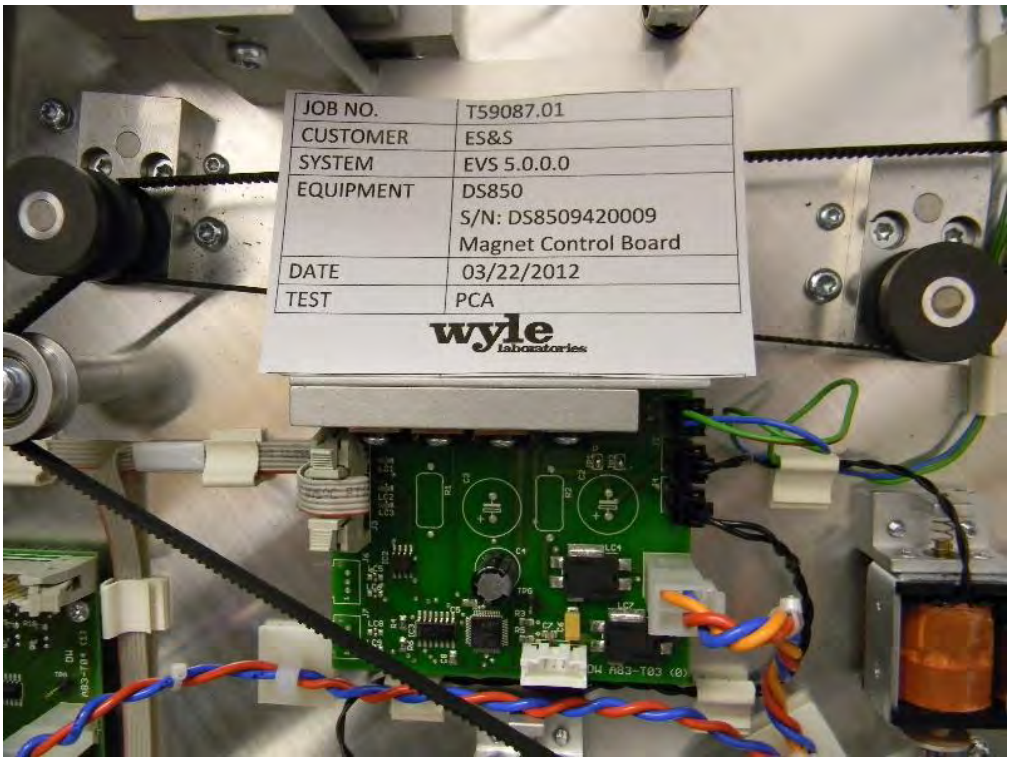
Main Power Supply Controller



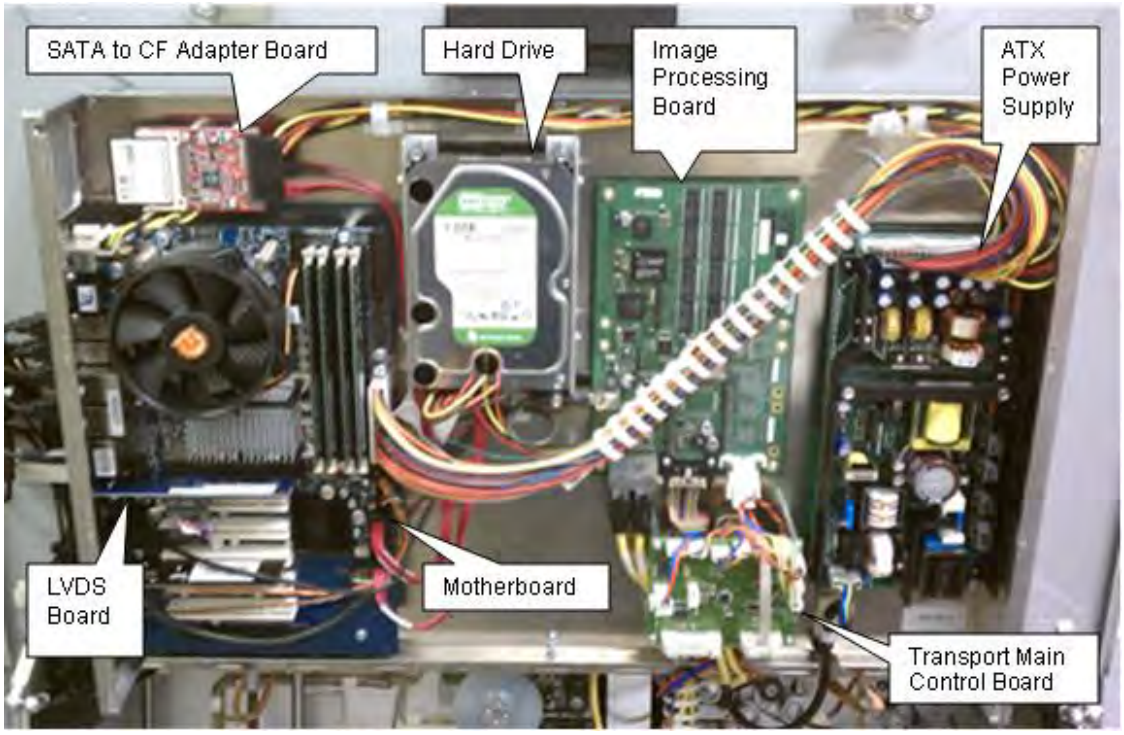
Main Power Supply



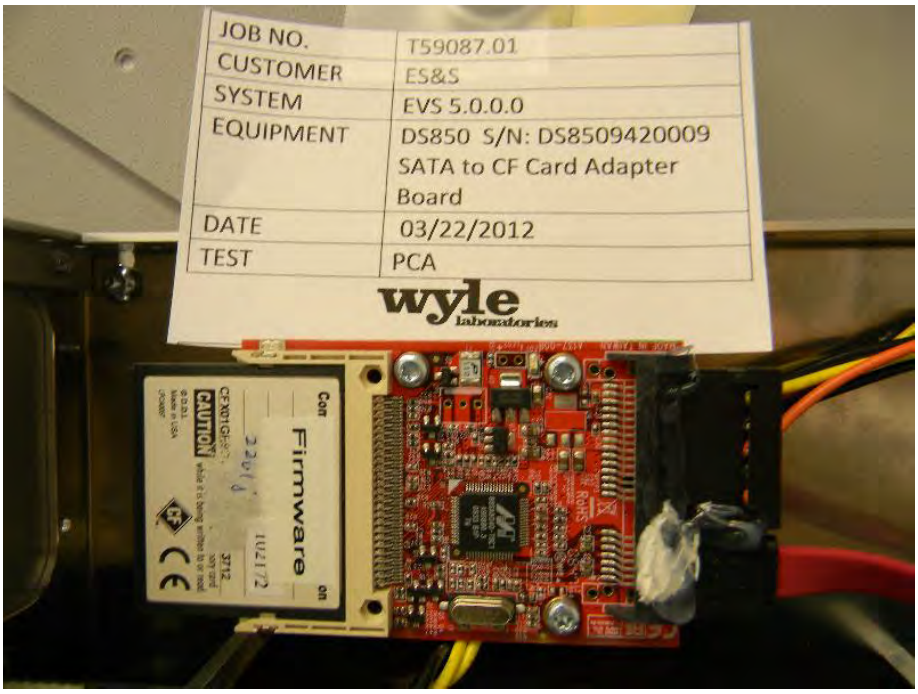
Light Barrier Board No.1



Magnet Control Board



The following picture identifies the hardware located inside the rear panel of the scanner.
From ES&S DS850 Maintenance Guide Document Version 1.0 Version Release: v.2.4



SATA to CF Adapter Board

Hard Drive

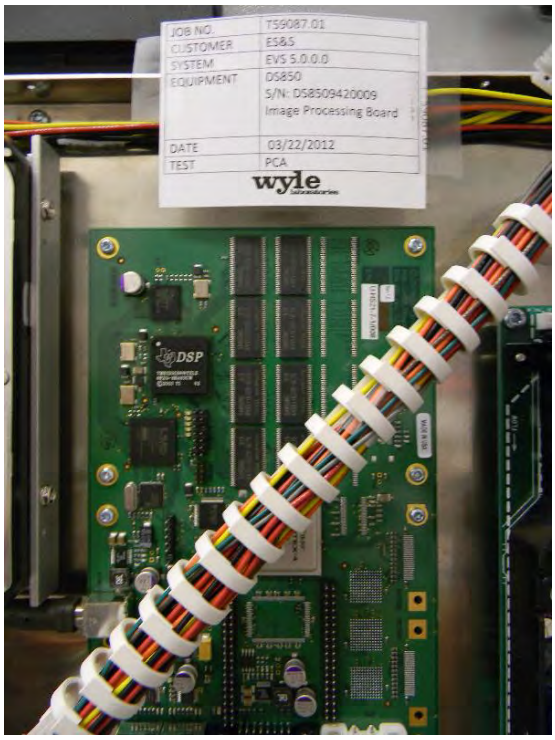
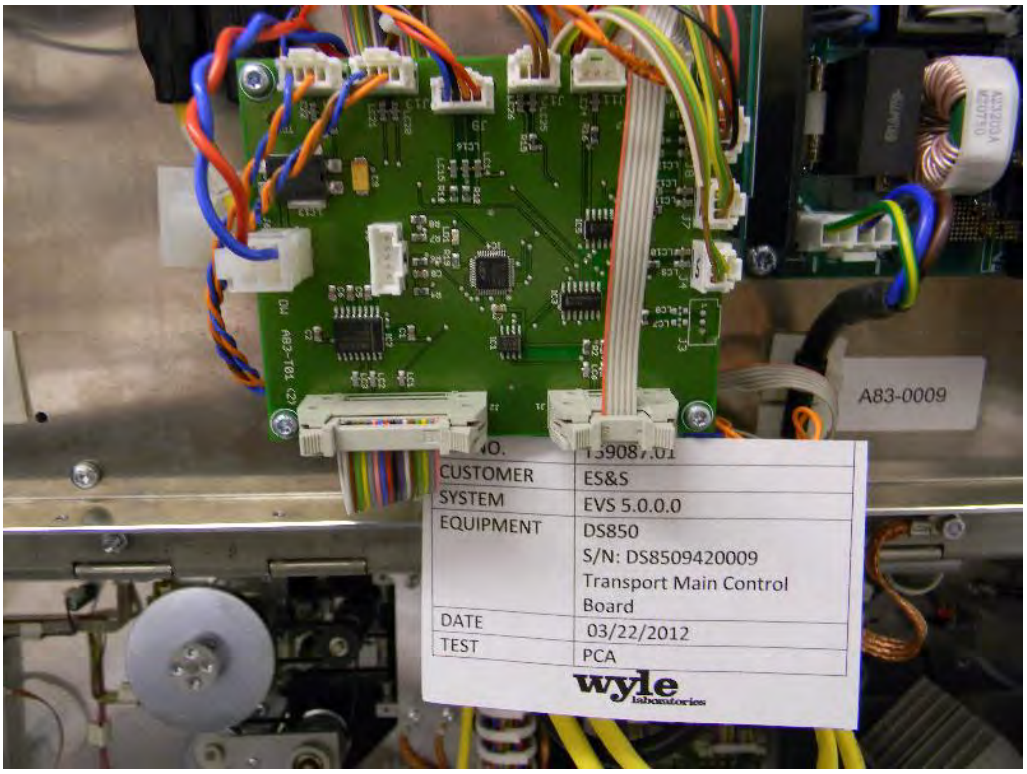
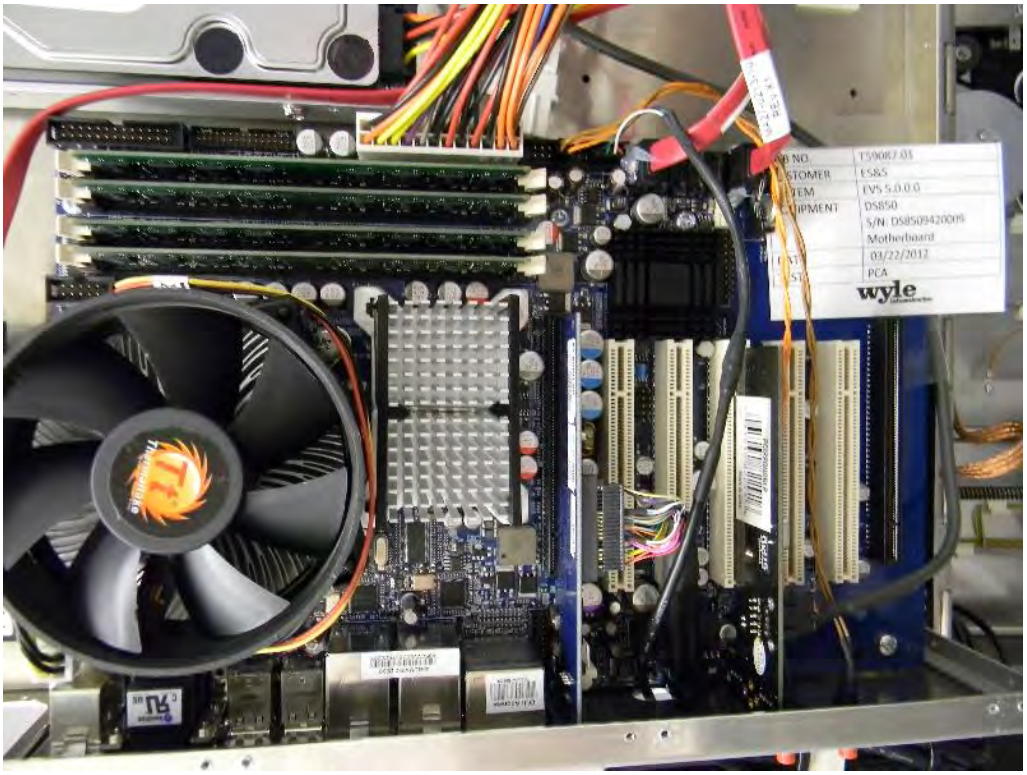


Image Processing Board

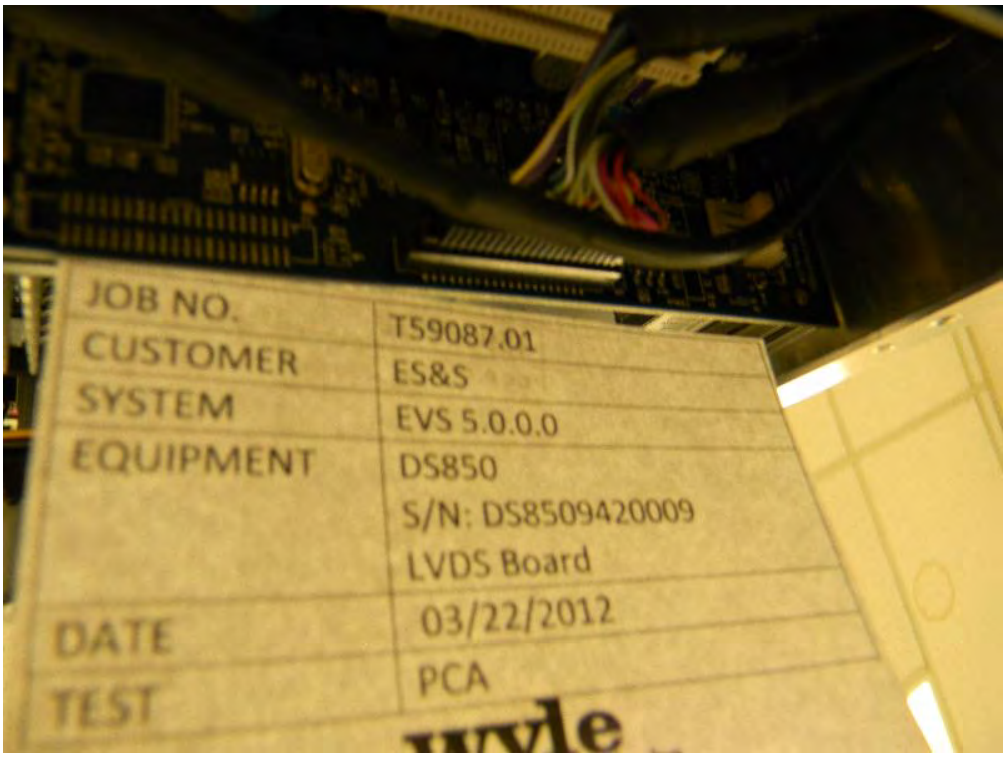
ATX Power Supply



Transport Main Control Board



Motherboard



LVDS Board

DS200 Plastic Ballot Box

DS200 Metal Ballot Box

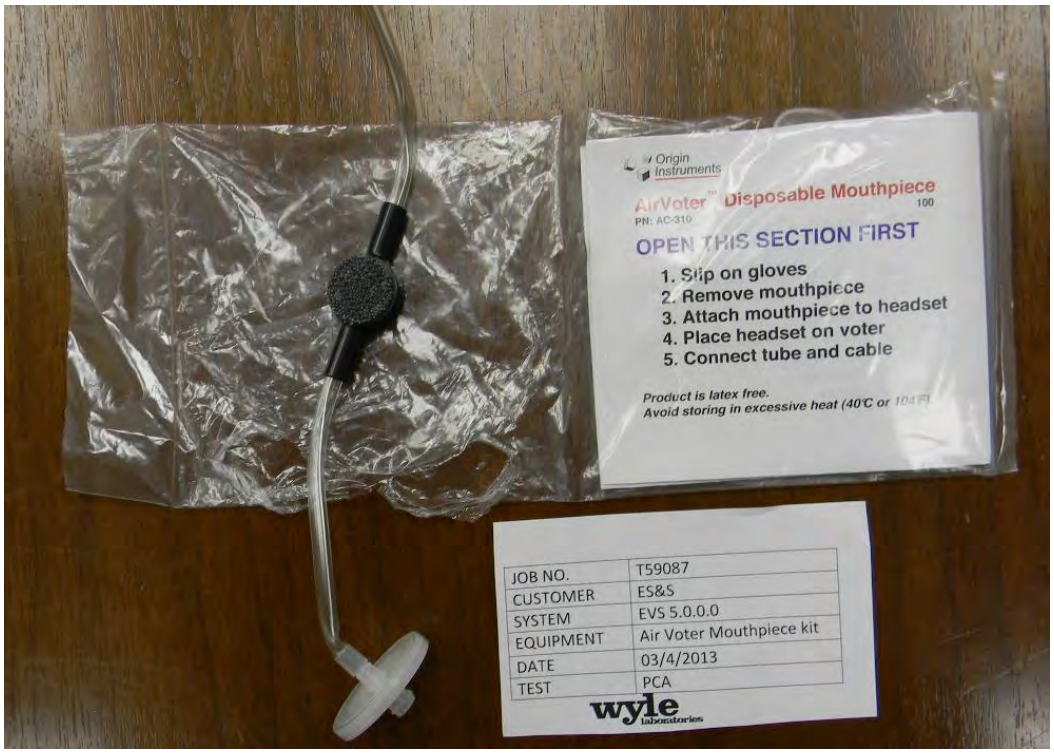
EMS Laptop

EMS Workstation

EMS Server

OKI Printer

ADA Footswitch



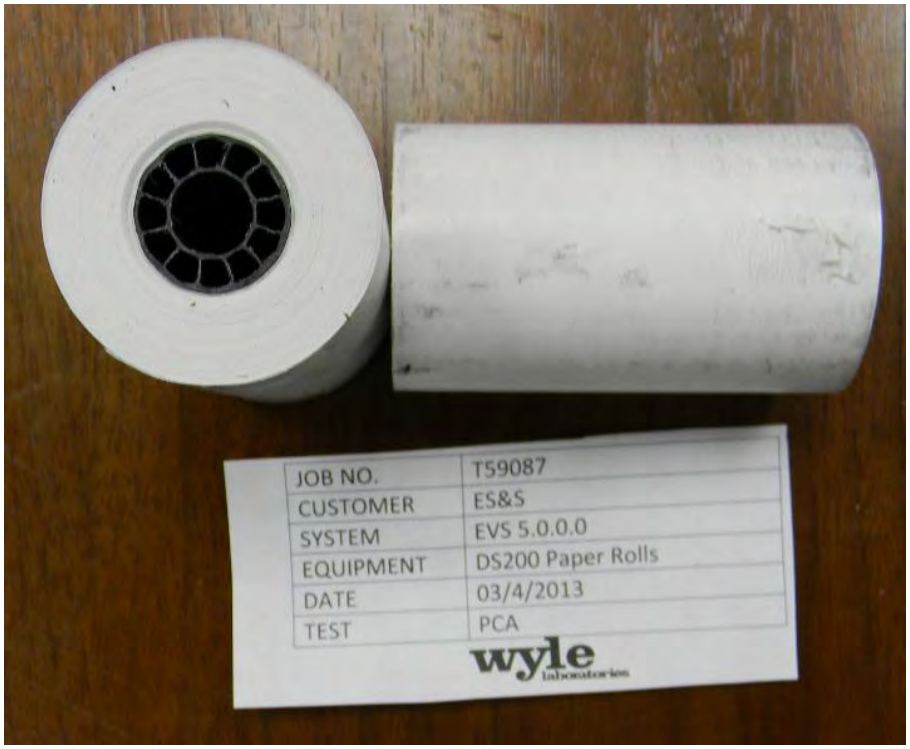
AirVoter Mouthpiece Kit

AutoMark A100

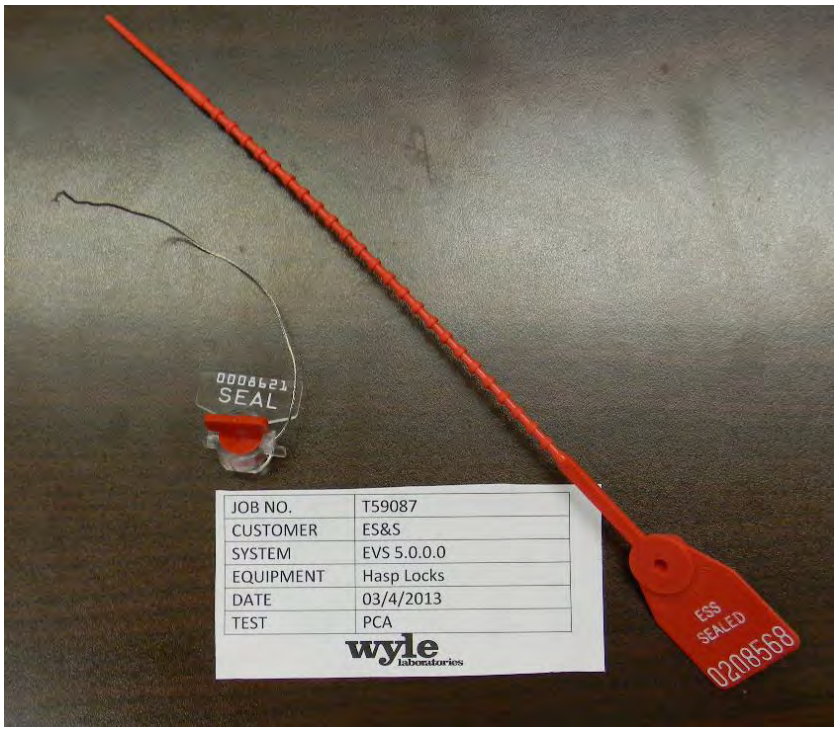
AutoMark A200

Compact Flash (CF) Cards

Dell Power Connect Switch



DS200 Paper Rolls

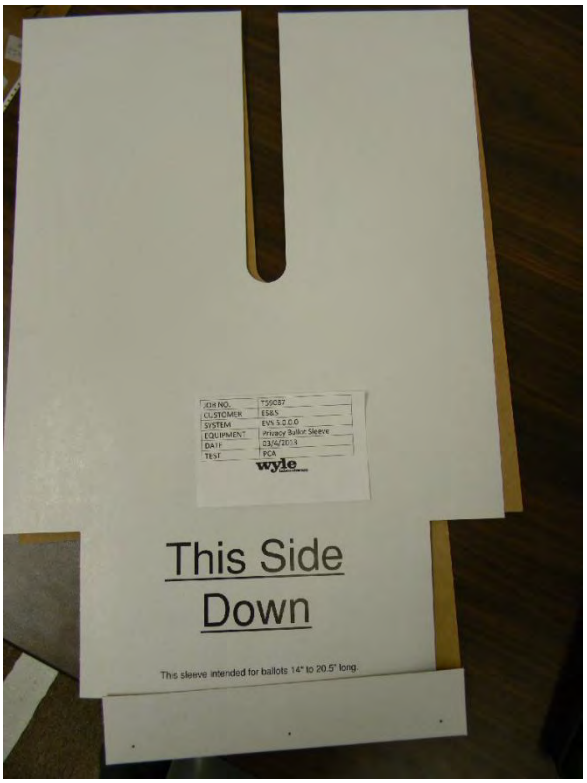


Hasp Locks

Headphones

Machine & Ballot Box Keys

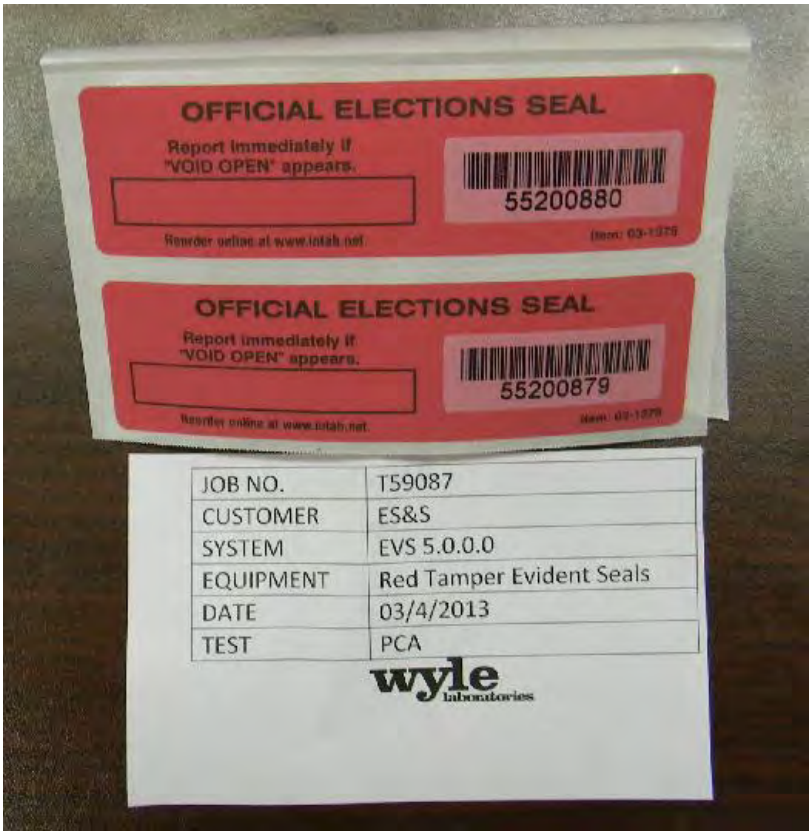
Vendor Specified Marking Device



Privacy Sleeve

Sandisk CF Card Reader/Writer

AirVoter Sip & Puff



Tamper Evident Seals

USB Media Device

Blue Security Ballot Storage/Transport Box

AutoMark Ink Cartridge

Magnifying Glass

AutoMark Table

AutoMark AutoCAST Ballot Box – Plastic

AutoMark AutoCAST Ballot Box - Cardboard